



# **Hydrogeological Risk Assessment Report**

Meridian Water Waste Recovery Permit Application

March 2024

**Waterman Infrastructure & Environment Limited** 

Pickfords Wharf, Clink Street, London, SE1 9DG www.watermangroup.com



Client Name: Taylor Woodrow Construction

Document Reference: WIE17335-300.R.30.3.1-HRA

Project Number: WIE17335

Project Document No: SIW-WAT-XX-XX-RP-W-000004

### Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

IssueDatePrepared byChecked byApproved byThirdMarch 2024Robbie J MooreFreddie AlcockFreddie Alcock

Senior Contaminated Land Consultant

Technical Director

Technical Director

E-W W-Z

Comments



### Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.



### **Contents**

**Glossary** Introduction......1 1.1 The Brief......1 1.2 1.3 14 Limitations and Constraints......2 Site Setting and Waste to be Recovered......3 2. 2.1 Information Used to Inform This Assessment.......3 2.2 Summary Characterisation of the Waste ......4 Conceptual Hydrogeological Site Model......5 3.1 Controlled Waters ......5 3.2 Source Assessment 10 3.3 Pathways.......14 3.4 4.1 The Nature of the Hydrogeological Risk Assessment ......17 4.2 43 The Priority Contaminants to be Modelled......19 4.4 4.5 Numerical Modelling......19 4.6 4.7 Hydrogeological Completion Criteria ......20 5. 5.1 Monitoring and Testing Regime ......24 5.2 5.3 6.1 Compliance with the Groundwater Regulations (2009) ......26 6.2 **Figures** Figure 1: Estimated Source of Waste Area..... **Tables** Table 1: Table 2: Permitted Site Geology Inferred from Previous Ground Investigation......5 Table 3: Summary of Hydrogeological Properties of the Main Geological Strata......6 Table 4: Groundwater Monitoring Locations Within and Proximal to SIW boundary......6 Table 5: Summary of Identified Contamination within Groundwater......8 Table 6: Ground Investigation Locations within Historical Landfill Area......12 Metals Values for Waste Recovery Area Sampling......13 Table 7: Table 8: Assessment of Potential Contaminant Linkages .......17



Table 9:	Monitoring Well Installation and Design for Groundwater Wells	21
Table 10:	Low Flow Monitoring Stabilisation Parameters	23
Table 11:	Monitoring Locations for Surface Waters	24
Table 12:	Contaminant Sampling Suite	25

# **Appendices**

- A. Site Plans
- B. Exploratory Hole Records



# **Glossary**

- The Permitted Site this refers to the proposed permitted area as defined in Plan D-ESSD1C.
- Meridian Water Strategic Infrastructure Works (SIW) the enabling works required in advance of the
  construction of Phase 2 of the Meridian Water Development. The works will occur across two
  adjacent areas termed Phase 1 SIW and Phase 2 SIW collectively 'the SIW site' for the purposes of
  the EP application documents.
- Development Zones (DZ) specific areas in Phase 2 Meridian Water Development referred to in planning documents. As shown on Plan D-ESSD1D.
- Edmonton Marshes flood relief storage basins to be excavated at the eastern end of the Permitted Site as part of the SIW in DZLV1. The waste the subject of this EP application will arise from excavation into the former Lea Valley Trading Estate landfill to create part of the flood relief storage basins.



### 1. Introduction

#### 1.1 The Brief

Waterman Infrastructure & Environment Limited ("Waterman") is instructed by Taylor Woodrow Construction, the civil engineering arm of Vinci Construction UK Limited ("the applicant" and "the operator") to prepare an application for an Environmental Permit (EP). The EP application is to authorise the permanent deposit of waste on land as a recovery activity. The waste recovery is for previously deposited (waste) soil and stones to be used in the waste recovery areas of the Strategic Infrastructure Works (SIW) at Meridian Water, Enfield, London ("the Permitted Site").

To support this EP application, a hydrogeological risk assessment (HRA) has been prepared detailing the potential for use of the waste to impact controlled waters at and surrounding the Permitted Site, including shallow groundwater, deep groundwater, and surface water receptors.

#### 1.2 Context

The Meridian Water scheme is a regeneration project led by the London Borough of Enfield (LBE). The permitted site is one small part of the wider Meridian Water scheme. The permitted site is centred at approximate National Grid Reference 535601, 191831.

Overall, the Meridian Water scheme will deliver:

- 10,000 new homes;
- 6,000 high quality jobs, a further 10,000 construction jobs;
- new train station;
- schools, healthcare provisions and other local services; and
- naturalisation of the Pymmes Brook and improved waterside public green spaces.

The first phase of the scheme ("Meridian One") was granted full planning permission and is underway. The new Meridian Water station opened in 2019, the first new school in 2017 and the first 950 homes are scheduled for completion in 2026 at Willoughby Lane.

LBE is now bringing forward Phase 2 of the Meridian Water scheme. Phase 2 is a residential led mixed use scheme including up to 2,300 new homes, various non- residential uses including workspace and a new school. To enable Phase 2, the SIW are required to prepare the development area including the implementation of flood mitigation measures.

Earthworks material will be excavated from various locations across the SIW site where the level needs to be lowered to provide flood storage basins or to create a suitable development platform level. Some material will be suitable for reuse in earthworks without treatment, other material will require remediation (regulated by separate mobile treatment plant permit). Material confirmed to be suitable for reuse will be moved to various locations in the SIW site where levels need to be raised. The cut and fill locations are shown on plan D-ESSD4.

Most of the material to be excavated and / or treated will be reused in accordance with the Definition of Waste: Development Industry Code of Practice (DoWCoP). However, some excavation will be necessary in an area that is considered by the Environment Agency (EA) to be an historic landfill site (Lee Valley Trading Estate Landfill located at the eastern end of the SIW site and shown on plan D-ESSD2E).

Material excavated from the landfill area is considered by the EA to be waste. The Environmental Permitting Regime applies to its use in recovery (permanent deposit in land). This material is the waste subject to EP controls. This regulatory constraint on the use of a proportion of the site derived excavation arisings risks overcomplicating the execution of the remediation and earthworks. The project remediation contractor intends to progress discussions with the local EA area team to agree the reduction of the extent of the Lee Valley Trading Estate Landfill, limiting the historic landfill boundary to the raised area of northern portion of the polygon shown on D-ESSD2E.



The SIW to be completed following land raising using waste may include roads, footpaths and development plots (works to the west of Harbet Road), and soft and hard landscaping between the new flood storage basins in Edmonton Marshes to the east of Harbet Road. In addition, waste soils may be used to create a growing medium (soil layer) in Brooks Park (east of Pymmes Brook). In addition, plans D-ESSD5V-Y provide sections through Brooks Park – the soils shown on plan D-ESSD5V may be waste.

Treatment of waste will be limited to sorting at the point of excavation to separately remove any gross contamination or large lumps of hard materials. Waste suitable for recovery will be stored in stockpiles, until required for use in earthworks in the permitted site. Waste may also be treated with lime or cement for moisture control and / or creation of capping material. Both applications will be for geotechnical improvement so should not require waste regulatory controls. However, should the EA disagree, the treatment will be carried out under mobile treatment plant permit and the relevant List of Waste codes included for in the waste recovery EP application.

### 1.3 Scope of This Report

To secure the EP for recovery of waste at the SIW, a Hydrogeological Risk Assessment (HRA) is required. This sets out the baseline controlled waters conditions at Meridian Water based on previous investigations relevant to the SIW, details the proposed use of waste, and sets out an assessment of the potential for this waste use to cause detriment to water quality. The report also includes a scheme of proposed monitoring pre- and post-deposition of the waste to demonstrate this activity has not caused impacts to water receptors.

This HRA has been developed in line with relevant EA guidance<sup>1</sup>. The EA further provides a template document for preparation of a HRA, which has formed the basis for this report structure and content. Any sections that are not applicable to the activity have been included for completeness, with an explanation of why they are not relevant.

The HRA will form part of the environmental management system (EMS) to be operated by the applicant for the lifetime of the EP. A copy of the HRA and EMS will be kept in Taylor Woodrow's site office.

Plans and drawings referred to in this report are to be found in the "ESSD drawings and information bundle" submitted as part of the EP application. In the text of this report the plans may be referred to in full or by abbreviated reference (e.g. D-ESSD1A).

This report should be read alongside the "Conceptual Site Model, Environmental Setting and Site Design Report" (ESSD report) prepared by Waterman and included in the EP application.

#### 1.4 Limitations and Constraints

Waterman has endeavoured to assess all information provided to them during the preparation of this document but makes no guarantees or warranties as to the accuracy or completeness of this information.

The conclusions resulting from this report are not necessarily indicative of future conditions or operating practices at or adjacent to the Permitted Site.

<sup>&</sup>lt;sup>1</sup> <u>https://www.gov.uk/guidance/landfill-developments-groundwater-risk-assessment-for-leachate</u> (accessed 16/06/2022).



# 2. Site Setting and Waste to be Recovered

#### 2.1 Information Used to Inform This Assessment

The Meridian Water Permitted Site and DZLV1 areas have been the subject of extensive historical desk study and ground investigation work in previous years. Relevant technical information has been utilised for this HRA where appropriate. This includes, but is not limited to the following:

- The planning applications for the scheme;
- Documents required to fulfil planning conditions (e.g. Construction Environmental Management Plan (CEMP) prepared by Taylor Woodrow);
- Data and analysis from ground investigation;
- · Waste classification analysis of samples collected from the former landfill area; and
- Specification for material suitable for use in the earthworks.

Table 1 details all reports and documents reviewed by Waterman with land quality information relevant to the Permitted Site and waste recovery area.

Table 1: Ground Investigation Information

Document	Author	Reference	Date	Relevant areas	Scope
Ground Contamination Baseline Report	ARUP	MWP2-2.2	24/4/2019	Entire Masterplan Area	Desk Study
Ground Contamination Risk Assessment, Strategic Infrastructure Works	ARUP	REP/260637/ CL/001	14/12/2020	Strategic Infrastructure Works	Ground Investigation
Meridian Water HIF and Infrastructure Ground Investigation – Factual Report	GTS	GTS-19-250	26/3/2020	Entire Masterplan Area	Ground Investigation
Meridian Water HIF and Infrastructure Ground Investigation – Phase 2	GTS	GT0120	15/9/2021	Strategic Infrastructure Works	Ground Investigation
London Borough of Enfield; Meridian Works, Enfield Phase 2 Geo-environmental survey	BWB	MWD-BWB- ZZ-XX-YE- RP-0001_Ph2	March 2020	DZ6 north	Ground Investigation
Lea Valley Landfill Technical Note	ARUP	SIW-001	08/04/2021	DZLV1	Technical Note
Strategic Infrastructure Works – Ground Contamination investigation, remediation and materials management framework	ARUP	MWP2-2.3	24/4/2019	Entire Masterplan Area	Remediation Framework
Ground Investigation interpretative Report – IKEA Clear Site, Leeside Road, Edmonton	SLR	409.05569.00 004	January 2019	DZ4 south	Ground Investigation



### 2.2 Summary Characterisation of the Waste

#### 2.2.1 Waste Area

For the purposes of this HRA, excavation arisings from construction of the Edmonton Marshes flood relief storage basins in DZLV1, in the area to be agreed by the project remediation contractor with the EA to be historic landfill, will be the waste the subject of this waste recovery EP application. The maximum of extent is the area of historic landfill shown on plan D-ESSD2E. Data arising from the area shown on plan D-ESSD2E is discussed in its entirety.

Area DZLV1 is predominantly disused scrub land, with a hardstanding area along the western edge in use as a scrap yard. It is bounded by Harbet Road to the south, west and north-west, the River Lea Diversion Channel to the east and the A406 north circular to the north.

#### 2.2.2 Origins of the Waste

Arup compiled a technical note of available information relating to the landfilling in April 2021 (*reference Meridian Water SIW-001 – appended to the Waste Recovery Plan*). Mapping information indicates Area DZLV1 has primarily remained undeveloped throughout its history, with the exception of the western side of this area. By 1963 this area was developed with hardstanding for use as a car park serving the adjacent Lea Valley Trading Estate.

Visual observations, historical mapping and records from previous ground investigations indicate the waste was considered most likely to have arisen during the excavation of the William Girling Reservoir north of the Permitted Site, and re-alignment of the River Lea Diversion Channel adjacent to the east. Ground investigation across DZLV1 in 2019 described the landfilled waste as comprising reworked natural soils and waste construction materials rather than household or commercial waste for example. However, amosite and chrysotile asbestos free fibres and fragments were also identified in samples of upper Made Ground at depths from surface level at 0m bgl down to 1.5m bgl. The estimated time period over which the waste was deposited is between the 1930s and 1950s.

As the waste material is natural in origin it is unlikely to contain significant elevated contaminant concentrations or have impacted the underlying natural deposits. Potentially contaminative land uses aside from the former landfilling are limited to recent fly tipping. The fly tipped material is likely to have resulted in contamination of the surface soils but unlikely to have contaminated the soils at depth. Historical potentially contaminative land uses are absent on DZLV1 outside the former landfill.

Further details of the historical deposition of these soils as waste are set out in the ESSD.



# 3. Conceptual Hydrogeological Site Model

The conceptual model for the SIW in its entirety is included in the ESSD report completed separately to this report. It should be read in conjunction and referred to in addition to this document. A summary of the conceptual site model with a focus on controlled waters included within this document.

Note that for the purposes of contaminated land assessment across the SIW site, Arup has split the SIW into two phases – Phase 1 SIW lies to the east of Pymmes Brook and Phase 2 SIW to the west of Pymmes Brook. This phase nomenclature is not to be confused with Phase 2 Meridian Water. See D-ESSD1D for development zone locations and the boundaries of Phases 1 and 2 SIW. Geology and Hydrogeology within the Permitted Site Area

A summary of geology across the permitted Site area where ground levels are to be raised is included in Table 2.

Table 2: Permitted Site Geology Inferred from Previous Ground Investigation

Table 2.	Termitied dite decology interred from Frevious Ground investigation				
Stratum	Area Covered	Estimated Thickness	Depth to Top of Stratum	Typical Description	
Made Ground	Entire Permitted Site	0 to 5	+8 to +15	Concrete, tarmac or topsoil over red-grey- brown slightly clayey sand and flint gravel with small fragments of brick, concrete, glass and plastic.	
Enfield Silt Member	Areas DZ2- DZ7 only	0 to 3	+9.5 to +10	Yellow-brown slightly clayey fine sands and silts	
Kempton Park Gravel Member	Entire Permitted Site	2 to 6	+6.5 to +11	Multicoloured sandy clayey flint gravel	
London Clay Formation	Entire Permitted Site	2 to 12	+2 to +7.5	Brown, fissured slightly sandy clay	
Harwich Formation	Central areas of Permitted Site	0.7 to 1.5	-1.8 to -6.5	Greenish-grey sandy calcareous clay	
Lambeth Group	Entire Permitted Site	5 to 16	-6 to +2.5	Brown-blue slightly mottled sandy clay with fine-medium sand partings.	
Thanet Formation	Entire Permitted Site	6 to 18	-19 to -3	Dark grey slightly silty fine-medium sand	
Chalk Group	Entire Permitted Site	100+ (not proven)	-30 to -20	Fractured white chalk with flints	

#### 3.1 Controlled Waters

### 3.1.1 Surface Waters

The surface waters of Pymmes Brook, Salmon Brook, and the River Lee (Navigation) intersect north to south across the Permitted Site, and the River Lea Diversion Channel flows north to south adjacent to the eastern SIW boundary. All waterways within and adjacent to the Permitted Site boundary are currently concrete lined and canalised.

### 3.1.2 Groundwater

The Environment Agency classification of the geological deposits underlying the SIW are as per Table 3.



Table 3: Summary of Hydrogeological Properties of the Main Geological Strata

Stratum	EA Classification	Hydrogeological Significance
Made Ground	Not classified	May contain local pockets of shallow groundwater
Enfield Silt Member		Moving important in connecting local chatractions or
Kempton Park Gravel Member	Secondary A Aquifer	May be important in supporting local abstractions or in providing baseflow to rivers and streams
London Clay Formation	Unproductive Strata	Contains insignificant quantities of vertically or laterally extensive groundwater
Lambeth Group	Secondary A Aquifer, however noted to not contain laterally extensive groundwater during previous investigations at the Site	May be important in supporting local abstractions or in providing baseflow to rivers and streams
Harwich Formation	Secondary A Aquifer, however noted to not contain laterally extensive groundwater during previous investigations at the Site	May be important in supporting local abstractions or in providing baseflow to rivers and streams
Thanet Formation	Secondary A Aquifer	May be important in supporting local abstractions or in providing baseflow to rivers and streams
Chalk Group	Principal Aquifer	Regionally important aquifer, likely to be used to support potable abstractions

The Permitted Site is within a groundwater Source Protection Zone II (outer catchment), with sections to the north and west also within a Zone 1 (inner catchment).

# 3.1.3 Current Groundwater Chemical Quality Within SIW Area

Existing groundwater chemical quality has been established from findings of previous ground investigations with locations within or proximal to the Permitted Site boundary. A summary of the relevant locations is set out in Table 4. A plan showing the exploratory hole locations is included in Appendix A.

Table 4: Groundwater Monitoring Locations Within and Proximal to SIW boundary

Relevant Locations Within Permitted Site		Relevant Loc boundary (wi	ations proximal to Permitted Site thin 25m)
Location	Target Stratum	Location	Target Stratum
2_BH2013	Kempton Park Gravel Member & Lambeth Group	2_BH2008	Kempton Park Gravel Member & Lambeth Group
2_BH2087	Chalk Group	3_BH2007	Chalk Group
3_BH2005	Kempton Park Gravel Member	4_BH2026	Kempton Park Gravel Member & Lambeth Group
3_BH2006	Kempton Park Gravel Member	4_BH2047	Chalk Group
4_BH2024	Kempton Park Gravel Member & Lambeth Group	4_BH2089	Chalk Group
4_BH2025	Kempton Park Gravel Member & Lambeth Group	6_BH2062	Chalk Group
4_BH2027	Chalk Group	6_BH2063	Kempton Park Gravel Member
4_BH2028	Kempton Park Gravel Member	6_BH2086	Kempton Park Gravel Member & Lambeth Group



BH2025   Kempton Park Gravel Member   T_BH2054   Kempton Park Gravel Member & Lambeth Group     BH2031   Kempton Park Gravel Member   Z_BH2057   Kempton Park Gravel Member     BH2036   Chalk Group   4_BH1006   Kempton Park Gravel Member     BH2038   Chalk Group   4_BH1002   Kempton Park Gravel Member     BH2043   Chalk Group   4_BH1002   Kempton Park Gravel Member     BH2045   Chalk Group   4_BH1003   Kempton Park Gravel Member     BH2045   Chalk Group   4_BH1003   Kempton Park Gravel Member     BH2081   Kempton Park Gravel Member   4_BH2048   Kempton Park Gravel Member     BH2082   Kempton Park Gravel Member   C_BH2060   Kempton Park Gravel Member     BH2081   Kempton Park Gravel Member   LV1_BH2078   Kempton Park Gravel Member     BH2016   Kempton Park Gravel Member   LV1_BH2075   Kempton Park Gravel Member     BH2017   Kempton Park Gravel Member   LV1_BH2075   Kempton Park Gravel Member     BH2018   Kempton Park Gravel Member   LV1_BH2075   Kempton Park Gravel Member     BH2021   Kempton Park Gravel Member   LV1_BH2075   Kempton Park Gravel Member     BH2022   Kempton Park Gravel Member   G_BH3003   Kempton Park Gravel Member & Lambeth Group     BH2023   Kempton Park Gravel Member   G_BH3001   Kempton Park Gravel Member & Lambeth Group     BH2055   Kempton Park Gravel Member   G_BH3002   Kempton Park Gravel Member & Lambeth Group     BH2005   Kempton Park Gravel Member   G_BH3002   Kempton Park Gravel Member & Lambeth Group     BH2006   Kempton Park Gravel Member   G_BH3001   Kempton Park Gravel Member & Lambeth Group     BH2007   Kempton Park Gravel Member   G_BH3002   Kempton Park Gravel Member & Lambeth Group     BH2008   Chalk Group   G_BH209   Chal	Relevant Loc	ations Within Permitted Site	Relevant Loca boundary (wit	tions proximal to Permitted Site hin 25m)
Lambeth Group  4_BH2031 Kempton Park Gravel Member  4_BH2036A Kempton Park Gravel Member  4_BH2038 Chalk Group  4_BH1006 Kempton Park Gravel Member  4_BH2043 Chalk Group  4_BH1002 Kempton Park Gravel Member  4_BH2045 Chalk Group  4_BH1003 Kempton Park Gravel Member  4_BH2048 Kempton Park Gravel Member  4_BH2081 Kempton Park Gravel Member  4_BH2082 Kempton Park Gravel Member  4_BH2082 Kempton Park Gravel Member  4_BH2060 Kempton Park Gravel Member  5_BH2016 Kempton Park Gravel Member  5_BH2017 Kempton Park Gravel Member  5_BH2018 Kempton Park Gravel Member  5_BH2019 Kempton Park Gravel Member  5_BH2011 Kempton Park Gravel Member  5_BH2012 Kempton Park Gravel Member  6_BH3003 Kempton Park Gravel Member  5_BH2021 Kempton Park Gravel Member  6_BH3003 Kempton Park Gravel Member  5_BH2022 Kempton Park Gravel Member  6_BH3001 Kempton Park Gravel Member  6_BH3002 Kempton Park Gravel Member & Lambeth Group  Kempton Park Gravel Member  6_BH3002 Kempton Park Gravel Member & Lambeth Group  Kempton Park Gravel Member  4_BH1004 Kempton Park Gravel Member  4_BH1005 Kempton Park Gravel Member  4_BH1005 Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member  4_BH2045 Chalk Group  5_BH2018 Chalk Group  5_BH2019 Chalk Group  5_BH2018 Chalk Group  6_BH3001 Kempton Park Gravel Member  4_BH3031 Kempton Park Gravel Member	Location	Target Stratum	Location	Target Stratum
4_BH2036A Kempton Park Gravel Member 4_BH2038 Chalk Group 4_BH1002 Kempton Park Gravel Member 4_BH2043 Chalk Group 4_BH1003 Kempton Park Gravel Member 4_BH2045 Chalk Group 4_BH1003 Kempton Park Gravel Member 4_BH2081 Kempton Park Gravel Member 4_BH2082 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2018 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 5_BH2019 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 5_BH2022 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 6_BH3004 Kempton Park Gravel Member 6_BH3005 Kempton Park Gravel Member 6_BH3006 Kempton Park Gravel Member 6_BH3007 Kempton Park Gravel Member 6_BH3008 Kempton Park Gravel Member 6_BH3009 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 6_BH3004 Kempton Park Gravel Member 6_BH3005 Kempton Park Gravel Member 6_BH3006 Kempton Park Gravel Member 6_BH3007 Kempton Park Gravel Member 6_BH3008 Kempton Park Gravel Member 6_BH3009 Kempton Park Gravel Member 6_BH3000 Kempton Park Gravel Member 6_	4_BH2029	Kempton Park Gravel Member	7_BH2054	Kempton Park Gravel Member & Lambeth Group
4_BH2038 Chalk Group 4_BH1006 Kempton Park Gravel Member 4_BH2043 Chalk Group 4_BH1002 Kempton Park Gravel Member 4_BH2045 Chalk Group 4_BH1003 Kempton Park Gravel Member 4_BH2081 Kempton Park Gravel Member 4_BH2082 Kempton Park Gravel Member 7_BH2060 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member 1_LV1_BH2078 Kempton Park Gravel Member 1_LV1_BH2078 Kempton Park Gravel Member 1_LV1_BH2078 Kempton Park Gravel Member 1_LV1_BH2075 Kempton Park Gravel Member 1_LV1_BH2073 Kempton Park Gravel Member 1_LV1_BH2074 Kempton Park Gravel Member 1_LV1_BH207	4_BH2031	Kempton Park Gravel Member	7_BH2057	Kempton Park Gravel Member
4_BH2043 Chalk Group 4_BH1002 Kempton Park Gravel Member 4_BH2045 Chalk Group 4_BH2048 Kempton Park Gravel Member 4_BH2081 Kempton Park Gravel Member 7_BH2060 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member 1_LV1_BH2078 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 1_LV1_BH2075 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 1_LV1_BH2075 Kempton Park Gravel Member 5_BH2019 Kempton Park Gravel Member 1_LV1_BH2073 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group 6_BH3001 Kempton Park Gravel Member 8_Lambeth Group 6_BH3001 Kempton Park Gravel Member 8_Lambeth Group 6_BH3002 Kempton Park Gravel Member 8_Lambeth Group 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group 6_BH3004 Kempton Park Gravel Member 8_Lambeth Group 6_BH3005 Kem	4_BH2036A	Kempton Park Gravel Member	2_BH2010	Chalk Group
4_BH2045 Chalk Group 4_BH1003 Kempton Park Gravel Member 4_BH2081 Kempton Park Gravel Member 4_BH2082 Kempton Park Gravel Member 7_BH2060 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member LV1_BH2078 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member LV1_BH2075 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member LV1_BH2075 Kempton Park Gravel Member 5_BH2019 Kempton Park Gravel Member LV1_BH2073 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 4_Lamboth Group Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 4_Lamboth Group Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 8_Lambeth Group Kempton Park Gravel Member 4_Lamboth Group	4_BH2038	Chalk Group	4_BH1006	Kempton Park Gravel Member
4_BH2081 Kempton Park Gravel Member 4_BH2082 Kempton Park Gravel Member 7_BH2060 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2019A Kempton Park Gravel Member 5_BH2019A Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 5_BH2021 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group 6_BH3002 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 8_Lambeth Group 7_BH2058 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH2044 Kempton Park Gravel Member 4_BH2032 Lambeth Group 4_BH2032 Lambeth Group 5_BH2015 Chalk Group 5_BH2015 Chalk Group 5_BH2016 Chalk Group 6_BH2017 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 6_BH3004 Kempton Park Gravel Member 6_BH3005 Kempton Park Gravel Member 6_BH3006 Kempton Park Gravel Member 6_BH3007 Kempton Park Gravel Member	4_BH2043	Chalk Group	4_BH1002	Kempton Park Gravel Member
4_BH2082 Kempton Park Gravel Member 7_BH2060 Kempton Park Gravel Member 5_BH2016 Kempton Park Gravel Member LV1_BH2078 Kempton Park Gravel Member LV1_BH2075 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member LV1_BH2073 Kempton Park Gravel Member 5_BH2019A Kempton Park Gravel Member LV1_BH2073 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group Rempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 8_Lambeth Group Rempton	4_BH2045	Chalk Group	4_BH1003	Kempton Park Gravel Member
5_BH2016 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2017 Kempton Park Gravel Member 5_BH2018 Kempton Park Gravel Member 5_BH2019 Kempton Park Gravel Member 5_BH2021 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 5_BH2022A Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member 8_Lambeth Group 6_BH2023 Kempton Park Gravel Member 8_Lambeth Group 6_BH3002 Kempton Park Gravel Member 8_Lambeth Group 6_BH3003 Kempton Park Gravel Member 8_Lambeth Group 6_BH3004 Kempton Park Gravel Member 8_Lambeth Group 6_BH2005 Kempton Park Gravel Member 8_BH1005 Kempton Park Gravel Member 8_BH2044 Kempton Park Gravel Member 8_BH2045 Chalk Group 6_BH2015 Chalk Group 6_BH2016 Chalk Group 6_BH2016 Chalk Group 6_BH2017 Chalk Group 6_BH2018 Chalk Group 6_BH2019 Kempton Park Gravel Member 6_BH2030 Kempton Park Gravel Member 6_BH2031 Kempton Park Gravel Member 6_BH2032 Kempton Park Gravel Member 6_BH2033 Kempton Park Gravel Member 6_BH2034 Kempton Park Gravel Member 6_BH2035 Kempton Park Gravel Member 6_BH2036 Kempton Park Gravel Member 6_BH2036 Kempton Park Gravel Member 6_BH2037 Kempton Park Gravel Member 6_BH2037 Kempton Park Gravel Member	4_BH2081	Kempton Park Gravel Member	4_BH2048	Kempton Park Gravel Member
5_BH2017 Kempton Park Gravel Member 5_BH2019A Kempton Park Gravel Member 5_BH2021 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member 5_BH2022A Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member & Lambeth Group 5_BH2022A Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member & Lambeth Group 5_BH2023 Kempton Park Gravel Member & Lambeth Group 5_BH2023 Kempton Park Gravel Member & Lambeth Group 5_BH2090 Kempton Park Gravel Member & Lambeth Group 5_BH2091 Kempton Park Gravel Member 4_BH1004 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH2044 Kempton Park Gravel Member 4_BH2032 Lambeth Group 4_BH2032 Lambeth Group 5_BH2015 Chalk Group 5_BH2016 Chalk Group 5_BH2018 Chalk Group 4_BH1001 Kempton Park Gravel Member 4_BH1001A Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2035 Kempton Park Gravel Member 4_BH2036 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member	4_BH2082	Kempton Park Gravel Member	7_BH2060	Kempton Park Gravel Member
5_BH2019A Kempton Park Gravel Member 5_BH2021 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member & Lambeth Group 5_BH2022A Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member & Lambeth Group 5_BH2023 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member & Lambeth Group 5_BH2090 Kempton Park Gravel Member & Lambeth Group 5_BH2090 Kempton Park Gravel Member & Lambeth Group 7_BH2058 Kempton Park Gravel Member 4_BH1004 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH2044 Kempton Park Gravel Member 4_BH2032 Lambeth Group 4_BH2032 Lambeth Group 5_BH2015 Chalk Group 5_BH2016 Chalk Group 5_BH2017 Chalk Group 5_BH2018 Chalk Group 5_BH2010 Kempton Park Gravel Member 4_BH10014 Kempton Park Gravel Member 4_BH10015 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2035 Kempton Park Gravel Member 4_BH2036 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member	5_BH2016	Kempton Park Gravel Member	LV1_BH2078	Kempton Park Gravel Member
5_BH2021 Kempton Park Gravel Member 6_BH3003 Kempton Park Gravel Member & Lambeth Group 5_BH2022A Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member & Lambeth Group 5_BH2023 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member & Lambeth Group 5_BH2090 Kempton Park Gravel Member & Lambeth Group 5_BH2058 Kempton Park Gravel Member 4_BH1004 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH2032 Lambeth Group 4_BH2032 Lambeth Group 4_BH2032 Lambeth Group 5_BH2015 Chalk Group 5_BH2016 Chalk Group 5_BH2017 Chalk Group 5_BH2018 Chalk Group 5_BH2018 Chalk Group 5_BH2020 Chalk Group 4_BH1001 Kempton Park Gravel Member 4_BH1001A Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member	5_BH2017	Kempton Park Gravel Member	LV1_BH2075	Kempton Park Gravel Member
Lambeth Group  5_BH2022A Kempton Park Gravel Member 6_BH3001 Kempton Park Gravel Member & Lambeth Group  5_BH2023 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member & Lambeth Group  5_BH2090 Kempton Park Gravel Member & Lambeth Group  7_BH2058 Kempton Park Gravel Member 4_BH1004 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2032 Lambeth Group  5_BH2015 Chalk Group  5_BH2016 Chalk Group  5_BH2018 Chalk Group  4_BH1001 Kempton Park Gravel Member 4_BH1001 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Me	5_BH2019A	Kempton Park Gravel Member	LV1_BH2073	Kempton Park Gravel Member
Eambeth Group  5_BH2023 Kempton Park Gravel Member 6_BH3002 Kempton Park Gravel Member & Lambeth Group  5_BH2090 Kempton Park Gravel Member & Lambeth Group  7_BH2058 Kempton Park Gravel Member  4_BH1004 Kempton Park Gravel Member  4_BH1005 Kempton Park Gravel Member  4_BH1005A Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2032 Lambeth Group  5_BH2015 Chalk Group  5_BH2016 Chalk Group  5_BH2017 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2021	Kempton Park Gravel Member	6_BH3003	Kempton Park Gravel Member & Lambeth Group
S_BH2090 Kempton Park Gravel Member & Lambeth Group  7_BH2058 Kempton Park Gravel Member  4_BH1004 Kempton Park Gravel Member  4_BH1005 Kempton Park Gravel Member  4_BH1005A Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2032 Lambeth Group  5_BH2015 Chalk Group  5_BH2015 Chalk Group  5_BH2010 Kempton Park Gravel Member  4_BH1001 Kempton Park Gravel Member  4_BH1001 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2022A	Kempton Park Gravel Member	6_BH3001	Kempton Park Gravel Member & Lambeth Group
Lambeth Group  7_BH2058 Kempton Park Gravel Member  4_BH1004 Kempton Park Gravel Member  4_BH1005 Kempton Park Gravel Member  4_BH1005A Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2016 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2031 Kempton Park Gravel Member  4_BH2032 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2023	Kempton Park Gravel Member	6_BH3002	Kempton Park Gravel Member & Lambeth Group
4_BH1004 Kempton Park Gravel Member 4_BH1005 Kempton Park Gravel Member 4_BH1005A Kempton Park Gravel Member 4_BH2044 Kempton Park Gravel Member & Lambeth Group 4_BH2032 Lambeth Group 4_BH2088 Chalk Group 5_BH2015 Chalk Group 5_BH2010 Chalk Group 5_BH2010 Kempton Park Gravel Member 4_BH1001 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2031 Kempton Park Gravel Member 4_BH2032 Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2035 Kempton Park Gravel Member 4_BH2036 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member	5_BH2090			
4_BH1005 Kempton Park Gravel Member  4_BH2044 Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2010 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2031 Kempton Park Gravel Member  4_BH2032 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	7_BH2058	Kempton Park Gravel Member		
4_BH1005A Kempton Park Gravel Member & Lambeth Group  4_BH2032 Lambeth Group  4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2031 Kempton Park Gravel Member  4_BH2032 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	4_BH1004	Kempton Park Gravel Member		
4_BH2032 Lambeth Group  4_BH2032 Lambeth Group  4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2031 Kempton Park Gravel Member  4_BH2032 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2066 Kempton Park Gravel Member  4_BH2076 Kempton Park Gravel Member  4_BH2077 Kempton Park Gravel Member	4_BH1005	Kempton Park Gravel Member		
Lambeth Group  4_BH2032 Lambeth Group  4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2031 Kempton Park Gravel Member  4_BH2032 Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	4_BH1005A	Kempton Park Gravel Member		
4_BH2088 Chalk Group  5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2035 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	4_BH2044			
5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	4_BH2032	Lambeth Group		
5_BH2015 Chalk Group  5_BH2018 Chalk Group  5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	4_BH2088	Chalk Group		
5_BH2020 Chalk Group  4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2036 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2015	Chalk Group		
4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2040 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2018	Chalk Group		
4_BH1001 Kempton Park Gravel Member  4_BH1001A Kempton Park Gravel Member  4_BH2033 Kempton Park Gravel Member  4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2040 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member	5_BH2020	Chalk Group		
4_BH1001A Kempton Park Gravel Member 4_BH2033 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2040 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member	4_BH1001	<u> </u>		
4_BH2033 Kempton Park Gravel Member 4_BH2030 Kempton Park Gravel Member 4_BH2034 Kempton Park Gravel Member 4_BH2040 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member		•		
4_BH2030 Kempton Park Gravel Member  4_BH2034 Kempton Park Gravel Member  4_BH2040 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member		•		
4_BH2034 Kempton Park Gravel Member  4_BH2040 Kempton Park Gravel Member  4_BH2037 Kempton Park Gravel Member		•		
4_BH2040 Kempton Park Gravel Member 4_BH2037 Kempton Park Gravel Member		•		
4_BH2037 Kempton Park Gravel Member		•		
<u> </u>		•		
	4_ВH2037 4_ВH2041	•		



Relevant Loc	ations Within Permitted Site	Relevant Loca boundary (with	tions proximal to Permitted Site nin 25m)
Location	Target Stratum	Location	Target Stratum
4_BH2041A	Kempton Park Gravel Member		
4_BH2042	Kempton Park Gravel Member		
4_BH2035	Kempton Park Gravel Member		
4_BH2039	Kempton Park Gravel Member		
4_BH2036	Kempton Park Gravel Member		
6_BH2064	Kempton Park Gravel Member		
5_BH2019	Kempton Park Gravel Member		
5_BH2021F	Kempton Park Gravel Member		

To determine existing groundwater quality in the areas where level changes are proposed, results of historical groundwater sampling and testing at ground investigations within the SIW boundary have been compiled.

Results for the shallow groundwater body within the Kempton Park Gravel Member, sporadic groundwater identified in the Lambeth Group, and deep groundwater in the Thanet Formation and Chalk Group have been compared to Waterman Generic Assessment Criteria (GAC) for drinking water. These GAC are based on EA derived Environmental Quality Standards (EQS) and UK Drinking Water Standards (DWS).

Identified exceedances of Waterman GAC from samples collected within or proximal to the Permitted Site boundary are detailed in Table 5.

Table 5: Summary of Identified Contamination within Groundwater

Contaminant	GAC (mg/l)	Mean value (mg/l)	Peak value recorded	Number of samples exceeding GAC	Total number of samples	
Shallow Aquifer (Kempton F	Shallow Aquifer (Kempton Park Gravel Member)					
Antimony	0.005	0.0014	0.0109	6	168	
Arsenic	0.01	0.0048	0.0292	23	188	
Chromium	0.05	0.0023	0.157	1	188	
Chromium VI	0.0034	0.0047	0.183	4	183	
Lead	0.01	0.0007	0.0493	2	188	
Selenium	0.01	0.0013	0.021	1	188	
Vanadium	0.02	0.0025	0.0485	3	182	
Zinc	0.0123	0.009	0.087	32	188	
Ammoniacal nitrogen	0.6	5.8042	67.9	143	187	
Cyanide	0.05	0.0566	1.9	37	188	
Manganese	0.123	0.4373	1.72	150	167	
Phenol	0.0077	0.0027	0.105	11	188	
TPH Aliphatic C8-10	0.3	0.0898	3.74	8	188	
TPH Aliphatic C10-12	0.3	0.2732	7.14	20	188	



Contaminant	GAC (mg/l)	Mean value (mg/l)	Peak value recorded	Number of samples exceeding GAC	Total number of samples
TPH Aliphatic C12-16	0.3	21.161	2800	29	183
TPH Aromatic C5-C7	0.01	0.0983	2.36	9	97
TPH Aromatic C8-10	0.3	0.0641	2.5	7	188
TPH Aromatic C10-12	0.09	0.1814	4.76	24	188
TPH Aromatic C12-16	0.09	6.0827	761	33	183
TPH Aromatic C16-21	0.09	13.148	1760	43	183
TPH Aromatic C21-35	0.09	5.3573	675	44	183
Acenaphthene	2.0	0.2233	26.2	2	183
Fluoranthene	0.0000063	0.1889	80.3	142	183
Naphthalene	0.002	0.0166	1.11	22	186
Anthracene	0.0001	0.0845	9.17	45	183
Benzo(a)pyrene	0.01	0.0192	1.56	13	183
Benzene	0.01	0.0535	3.33	11	188
Toluene	0.074	0.0038	0.11	1	188
Ethylbenzene	0.074	0.0039	0.0496	4	188
Xylene	0.03	0.0078	0.0425	2	167
Chloroethene	0.0005	0.0015	0.0131	25	188
Cis (1,2) Dichloroethene	0.05	0.0011	0.0583	1	188
Intermediate Aquifer (Lamb					
Arsenic	0.01	0.0017	0.0247	1	64
Chromium VI	0.05	0.0052	0.062	3	61
Nickel	0.02	0.0041	0.0308	3	64
Zinc	0.0123	0.0054	0.0305	8	64
Ammoniacal Nitrogen	0.6	1.2207	8.02	38	64
Cyanide	0.05	0.0145	0.103	6	64
Manganese	0.123	66.066	1290	38	64
TPH Aliphatic C8-10	0.3	0.0364	0.58	3	64
TPH Aliphatic C10-12	0.3	0.0359	0.604	2	64
TPH Aliphatic C12-16	0.3	0.7375	20.7	10	61
TPH Aromatics >C5-C7	0.01	0.2093	2.38	31	61
TPH Aromatics >C6-7	0.7	3.0256	67.1	20	61
Fluoranthene	0.0000063	0.0016	0.102	57	61
Anthracene	0.0001	0.0005	0.00973	16	61
Benzene	0.01	0.0056	0.0552	4	64
Xylene	0.03	0.0144	0.24	4	64



Contaminant	GAC (mg/l)	Mean value (mg/l)	Peak value recorded	Number of samples exceeding GAC	Total number of samples
Chromium VI	0.0034	0.0039	0.00871	3	94
Zinc	0.0123	0.0052	0.0295	8	95
Ammoniacal nitrogen	0.6	8.659	79.1	65	95
Cyanide	0.05	0.0565	0.336	36	95
Manganese	0.123	0.3829	1.69	45	90
TPH Aliphatic C12-16	0.3	0.0751	3.16	4	93
TPH Aromatic C5-7	0.01	0.1523	4.22	42	93
TPH Aromatic C6-7	0.7	0.5904	10.2	17	90
Fluoranthene	0.0000063	0.001	0.0653	76	93
Naphthalene	0.002	0.0055	0.173	9	95
Anthracene	0.0001	0.0001	0.00173	13	93
Benzene	0.01	0.0040	0.013	3	95
Chloroethene	0.0005	0.0015	0.0087	22	95
Bis(2-ethylhexyl)phthalate	0.0013	0.0047	0.0221	9	91
Di-n-butyl phthalate	0.008	0.0062	0.334	2	88

Findings of the previous investigation works indicate that within the SIW boundary both shallow and deeper groundwater bodies have been impacted by contamination including metals, ammoniacal nitrogen, cyanide and hydrocarbons including VOCs and SVOCs.

Chemical quality for the waste to be used has been assessed against existing groundwater quality to determine if use of this material will cause further detriment to shallow and deep aquifers. This has been done according to the source-pathway-receptor model.

#### 3.2 Source Assessment

#### 3.2.1 DZLV1 Source Area

Area DZLV1 is predominantly disused scrub land, with a hardstanding area along the western edge in use as a scrap yard. It is bounded by Harbet Road to the south and west, the River Lea Diversion Channel to the east and the A406 north circular to the north.

The EA classify part of the DZLV1 area in the north-west, west and south-west as a historical landfill. A plan detailing the estimated landfill area at DZLV1 from historical desk study sources is set out in Figure 1. It is also shown on plan D-ESSD2E. Note this is the maximum extent of historic landfill, the project remediation contractor will be seeking to agree with the EA a reduced area of historic landfill.



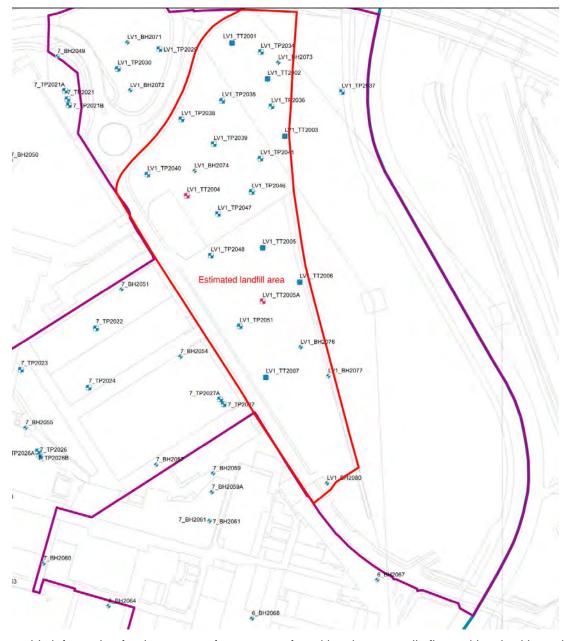


Figure 1: Estimated Source of Waste Area

Topographic information for the source of waste area found it to be generally flat and level, with a raised area in the north about 4m higher than the surrounding land.

Visual observations, historical mapping and records from previous ground investigations indicate the waste was considered most likely to have arisen during the excavation of the William Girling Reservoir north of the permitted Site, and re-alignment of the River Lea Diversion Channel adjacent to the east.

Intrusive ground investigations have formed a profile for the ground (waste) currently occupying the DZLV1 landfill area. Within the landfill polygon, a layer of Made Ground generally 1-2m thick is present above re-worked natural soils such as clay, sands and gravels. Estimated emplacement date of this landfill is between the 1930s and 1950s.

Where the landfilled waste is natural in origin it is unlikely to contain elevated contaminant concentrations or have impacted the underlying natural deposits. Potentially contaminative land uses outside the historical landfill are limited to recent fly tipping. The fly tipped material is likely to have resulted in contamination of the surface soils but unlikely to have contaminated the soils at depth. Historical potentially contaminative land uses are absent on DZLV1 outside the historical landfill.



A summary of previous investigation locations with soil chemical quality data completed within the historical landfill area is in Table 6. A plan showing locations of these exploratory holes is included in Appendix A.

Table 6: Ground Investigation Locations within Historical Landfill Area

Feature	Ground Level (m OD)	Depth Excavated (m)
Boreholes		
DZLV1_BH2073	+10.69	6.25
DZLV1_BH2074	+15.91	49.45
DZLV1_BH2076	+11.8	9.4
DZLV1_BH2077	+11.9	35.27
DZLV1_BH2080	+10.57	31.82
Trial Pits		
DZLV1_TP2034	+14.49	4
DZLV1_TP2035	+14.57	3
DZLV1_TP2036	+14.45	3
DZLV1_TP038	+12.19	4.9
DZLV1_TP2039	+14.6	5.6
DZLV1_TP2040	+11.36	3
DZLV1_TP2041	+14.7	5.6
DZLV1_TP2046	+14.55	5.6
DZLV1_TP2047	+14.56	4.2
DZLV1_TP2048	+11.72	3
DZLV1_TP2051	+11.84	3
Trial Trenches		
DZLV1_TT2001	+10.76	3
DZLV1_TT2002	+10.61	1.7
DZLV1_TT2003	+11.2	5.2
DZLV1_TT2004	+12.51	5.3
DZLV1_TT2005	+11.78	3.2
DZLV1_TT2006	+11.84	3.3
DZLV1_TT2007	+11.9	3

### 3.2.2 Chemical Quality of the Waste

Boreholes undertaken across the DZLV1 area identified the geology as Topsoil and Made Ground at surface, generally around 2m - 3.5m thickness but up to 6.7m locally at the mound area in the north. The uppermost 1m of Made Ground and mound in the north of DZLV1 comprised mixed natural material and construction waste. Deeper Made Ground is predominantly clayey soils with occasional gravel, cobbles and fragments of concrete or brick.



Underlying natural soils comprise 0.4 to 5.5m of Alluvium, then 1.3 to 5m Kempton Park Gravel Member and 8.5 to 12.3m London Clay Formation which thins from east to west.

For most of the locations, no visual or olfactory evidence for contamination was identified during the intrusive works. At location DZLV1\_TT2006 a hydrocarbon odour was noted within the Made Ground between 0.25m bgl and 0.35m bgl.

Discarded household waste was present dumped at surface level across the eastern half of DVLV1, however this has arisen recently and is not representative of the historical waste.

#### Chemical Results - Metals

Metals testing within the waste recorded elevated concentrations including lead up to 3,070mg/kg, and zinc up to 1,600mg/kg. Total metals concentrations recorded in samples from the waste proposed for use are detailed in Table 7.

Table 7: Metals Values for Waste Recovery Area Sampling

Determinant	Value Range (mg/kg)	Mean Value (mg/kg)
Arsenic	5.44 to 28.9	13.03
Cadmium	0.03 to 1.24	0.33
Chromium	7.41 to 64.4	25.31
Copper	3.76 to 276	45.89
Mercury	<0.0001 to 0.18	0.03
Nickel	9.2 to 54	28.08
Lead	4.77 to 3070	259.70
Selenium	1.1 to 2.19	1.57
Zinc	17.3 to 1600	162.82

Leachate testing results for metals are not available.

#### Chemical Results - Hydrocarbons

Within the completed investigation works at the DZLV1 area, thirty-five samples were collected from the waste proposed for use.

Evidence for significant hydrocarbon contamination within natural soils was not identified during intrusive works. A sample of the Made Ground collected at 0.3m bgl from location DZLV1\_TT2006 where hydrocarbon odour was reported during drilling works did not identify any elevated concentrations of hydrocarbons.

Total Petroleum Hydrocarbons (TPH) results identified some areas of elevated hydrocarbon concentrations around location DZLV1\_TP2047 at the mound in the north of DZLV1. A value of 749mg/kg for TPH was recorded at 0.1m bgl, decreasing to 201mg/kg at 2.1m bgl and falling below the limit of detection at 3.1m bgl. Across the remainder of the DZLV1 area slightly elevated hydrocarbons up to 278mg/kg were detected, however none were above the inert waste limit of 500mg/kg.

Elevated Polycyclic Aromatic Hydrocarbon (PAH) concentrations were detected in areas across DZLV1 up to 152mg/kg, however occurrences were sporadic and did not indicate a significant hot-spot of contamination.



#### Chemical Results - Asbestos

Fragments of amosite asbestos were found in four samples across the historical landfill section of the DZLV1 area. Of these, three also contained chrysotile asbestos, with a further sample containing chrysotile only. Quantification of asbestos where found did not record it to comprise more than 1% of any sample collected.

#### 3.2.3 Waste Classification

Ahead of works at the Permitted Site, the surface household waste and uppermost 0.3m layer of Made Ground soils at DZLV1 will be separately excavated and removed, and will not be used for the SIW. As part of the Arup 2019-2020 ground investigations, waste classification was undertaken on samples from the historical landfill area at DZLV1, including samples of the underlying waste with potential for use.

Thirty-four samples of Made Ground collected between 0.3m bgl and 5.5m bgl, five samples of Alluvium between 2.4m bgl and 5.5m bgl and two samples of underlying natural soils at 4.6m bgl and 4.9m bgl were assessed in accordance with WM3 using the software package HazWasteOnline.

The outputs of this assessment found that all natural soils and alluvium samples would be classified as non-hazardous waste. Within the Made Ground, thirty-three of the thirty-four samples assessed were identified as non-hazardous. However, a sample collected from location DZLV1\_TP2046 at 1m depth was determined to have potentially hazardous properties due to elevated concentrations of lead, chromium (VI) oxide and zinc oxide. Logs for this sample area recorded the shallow ground as containing multiple fragments of household waste including wiring and broken glass, which may have contributed to the elevated metals concentrations. The presence of this household waste would render the waste as physically unsuitable for use in any event, and it would be visually screened out of the larger waste body ahead of use.

Overall, the findings of sampling within the historical landfill area indicate it is not significantly contaminated, and the soils due to be excavated and used would be capable of being classified as non-hazardous waste.

Considering the origins and contamination status of this waste, it is considered that use of this waste will not introduce a new source of potential contamination once emplacement works are complete. Therefore, the principal risks to water resources at the Permitted Site remain the existing groundwater contamination previously identified through multiple historical investigation works.

#### 3.2.4 Groundwater Quality within Waste Source Area

Groundwater wells targeting the shallow Secondary A Aquifer in the Kempton Park Gravel Member within the DZLV1 waste recovery area found minor elevations of concentrations of some contaminants in the shallow groundwater when compared to EA EQS and DWS, however these low levels in groundwater are not significant and well below concentrations found across the Permitted Site area. The original emplacement of the waste to this area is considered not to have caused deterioration of groundwater quality within DZLV1.

### 3.3 Pathways

### 3.3.1 Groundwater

The works to raise ground levels within the SIW will involve excavation of existing hardstanding and clearing of obstructions within this area, followed by transport and emplacement of the waste to create the new formation level. The resultant situation in these areas will be waste emplaced directly above residual soils.



The SIW to be completed following land raising using waste may include roads, footpaths and development plots (works to the west of Harbet Road), and soft and hard landscaping between the new flood storage basins in Edmonton Marshes to the east of Harbet Road.

Should contamination be present within the emplaced waste, the potential pathway for this would be downward migration of leachate into the underlying in-situ soils. Following on from this, the contamination could be dispersed through the shallow aquifer in the Kempton Park Gravel Member to the wider Meridian Water area and further off-site. However, waste acceptance procedures will be put in place throughout use of the material to ensure no contamination source is created through the use. Control measures are set out in the Waste Acceptance Procedures (WAP) document for the works.

In addition, waste soils may be used to create a growing medium (soil layer) in Brooks Park. In those areas of Brooks Park located in Phase 1 SIW, the soils will be placed above an impermeable layer.

This impermeable layer will not be installed at the Phase 2 SIW Brooks Park area, as the existing river wall will remain in place and will prevent rainfall-driven groundwater migration to the wider site. The impermeable layer across Brooks Park in Phase 1 SIW, is required to prevent rainfall potentially mobilising contaminants in the underlying soils to groundwater, rather than being necessary to protect underlying groundwater from the waste used as a plant growth medium. As any waste recovered in Brooks Park will be subject to the more stringent cover soils reuse criteria (see Waste Acceptance Procedures submitted with the EP application).

Plans D-ESSD5V, X and Y provide sections through Brooks Park – the soils shown on plan D-ESSD5V may be waste. Plans D-ESSD5X and Y show the impermeable clay layer across Brooks Park in sections.

#### 3.3.2 Surface Waters

The SIW boundary is intersected by the River Lee (Navigation), Pymmes Brook and Salmon Brook. The River Lea Diversion Channel runs adjacent to the SIW eastern boundary. These waterways are currently channelised and lined with concrete. During construction works, surface run-off to areas immediately adjacent to the Permitted Site is possible.

Development proposals involve naturalisation of sections of these waterways at Brooks Park, with removal of the concrete barriers between the surface water and shallow groundwater. To prevent the removal of this concrete channel creating a potential migration pathway between these water bodies with subsequent potential contamination pathway, naturalisation works at Brooks Park will include construction of a hydraulic cut-off wall keyed into the top of the London Clay surrounding the area of the new naturalised Pymmes Brook channel.

The works also include excavation to formation followed by installation of an impermeable barrier across the entirety of Brooks Park within the SIW Phase 1 area thereby preventing downward migration of precipitation and surface water to groundwater.

On both ends of the new Pymmes Brook naturalised channel, the impermeable barrier will be constructed to tie in with the retained Pymmes Brook concrete channel to the north and south of the new naturalised channel, creating a continuous impermeable barrier, preventing connectivity of brook water to groundwater. Details for the impermeable barrier are shown on the plans and sections D-ESSD5W-Y.

### 3.4 Receptors

### 3.4.1 Receptors During the Works

During the works, the waste will be directly transported to areas where ground level raising is required. As the waste will be exposed during this process, the potential exists for surface run-off or dust emissions to reach the nearby surface waters at the River Lea Diversion Channel, River Lee (Navigation), Pymmes Brook and Salmon Brook.



During the works to complete the level raising, existing hardstanding covering the majority of the Permitted Site will be excavated and removed. This will be done both in areas where filling is required to raise levels, and where cut is necessary to reduce levels. For the period that this hardstanding is not present, underlying soils will be exposed. This in turn will lead to increased rainwater infiltration, which could increase migration of any contamination in shallow soils or in the waste downwards to the shallow water body.

### 3.4.2 Receptors at Completed Permitted Area

On completion of the works, the waste will be capped by buildings, hardstanding, landscaping and rain gardens for surface water attenuation. This capping layer will prevent runoff and dust emissions, and reduce rainfall infiltration to ground. Furthermore, all sustainable drainage installed (including the entirety of Brooks Park in Phase 1 SIW) will be underlain to form an impermeable barrier with the surrounding ground and groundwater. Subsequently, contaminant migration through groundwater driven by rainfall infiltration will be reduced but may still occur at the naturalised Edmonton Marshes area where lining is not proposed due to the absence of significant contaminants in the ground.

Surrounding potential groundwater receptors include the shallow aquifer within the Kempton Park Gravel Member, and deeper water bodies in the Harwich Formation, Lambeth Group, Thanet Formation and Chalk Group. Installation of the hydraulic cut off wall in this area, retention of the existing concrete channel of the former Pymmes Brook and installation of the impermeable barrier at the naturalised Pymmes Brook and Brook Park will prevent existing contamination within the shallow groundwater in the SIW area migrating to these waterways.

Remediation of the existing contamination is set out in a Remediation Strategy and Verification Plans documents for SIW Phase 1 and 2 developed by Arup and included for reference in the EP application. This remediation work will be undertaken ahead of the SIW construction commencing, reducing the potential for hydraulic continuity between the shallow groundwater and surface waters to carry contamination to the wider Site.



# 4. Hydrogeological Risk Assessment

### 4.1 The Nature of the Hydrogeological Risk Assessment

Arup has undertaken significant previous groundwater quality research across the Meridian Water Masterplan area, including the Permitted Site area. Two phases of intrusive ground works were completed between 2019 and 2020, with results set out in two interpretive reports by Arup (*reference MWP2-2.2; April 2019 and REP/260637/CL/001; December 2020*). As part of these works, a minimum of six rounds of groundwater sampling were completed at all boreholes within the Permitted Site and across the wider Masterplan area.

Findings of this groundwater monitoring have been reported within the Arup interpretive reports and provided to the EA local groundwater team (as a technical consultee to the LBE planning team). Detailed discussions on groundwater quality across Meridian Water have been held between EA and LBE, with Arup, Taylor Woodrow and Waterman. For these reasons, it is considered that the contamination status of shallow and deep groundwater at the Site has been well investigated, and further risk assessment is not necessary. For the purposes of the EP application, a qualitative assessment of risk from the use of specific non-hazardous waste is considered proportionate.

Ground investigation findings for the source area indicate the waste proposed to be used under the waste recovery EP will comprise non-hazardous material. Emplacement of this material to build up levels is anticipated not to introduce a new source of contamination to the Site. Acceptance procedures for the waste set out in the Waste Acceptance Procedures (WAP) included in the EP application will ensure any unacceptable contamination in the waste is identified, and that such waste is not used.

Potential contaminant pathways have been identified during the works from runoff or dust emissions from exposed soils. These risks would be managed through implementation of the Construction Environment Management Plan (CEMP) prepared for the works by Taylor Woodrow (reference SIW-TWC-XX-XX-PL-W-000002) and a Dust Emissions Management Plan (DEMP) prepared for the works, as described in the Environmental Risk Assessment (ERA) included in the EP application. Furthermore, prior remediation of the groundwater within and surrounding the Permitted Site is anticipated as detailed in the Arup Remediation Strategies. Therefore, throughout the use process the source-pathway-receptor pollutant linkage would be incomplete, and as such further hydrogeological risk assessment is deemed not required.

Complex risk assessment is considered unnecessary due to the absence of significant contaminant sources within the waste, and lack of uncontrolled pathways to receptors either during or on completion of the works.

### 4.2 The Proposed Assessment Scenarios

Two scenarios are considered – the duration of the works, and the completed development. Table 8 details the potential contaminant linkages in each scenario along with the relevant mitigation measures.

Table 8: Assessment of Potential Contaminant Linkages

Source	Pathway	Receptor	Mitigation
During Constru	uction Works		
Existing shallow soils and groundwater contamination	Rainfall-driven migration of contamination to shallow groundwater	Shallow Secondary A Aquifer in the Kempton Park Gravel Member	Remediation works as set out in ARUP remediation strategies
Potential	Downward migration	Shallow	Chemical analysis of the waste to be used has not



Source	Pathway	Receptor	Mitigation
contamination in waste emplaced within the Permitted Site to build up levels	of leachate into the underlying in-situ soils and shallow groundwater	Secondary A Aquifer in the Kempton Park Gravel Member	identified potential for it to act as a contamination source  Acceptance procedures set out in the WAP will ensure any unacceptable contamination in the waste is identified, and that such waste is not used
	Surface run-off from emplaced soils	Surface water bodies at the River Lea Diversion Channel, River Lee (Navigation), Pymmes Brook and Salmon Brook	Implementation of a CEMP for the works including measures to minimise run-off
	Surface run-off and dust emissions from emplaced soils	Construction workers and visitors to the Permitted Site and surrounding area	Implementation of a CEMP and DEMP for the works
Completed Dev	relopment		
Potential contamination in waste emplaced within the Permitted Site to build up levels	Rainfall-driven migration of contamination to shallow groundwater via naturalised Pymmes Brook and new Brooks Park landscaping	Shallow Secondary A Aquifer in the Kempton Park Gravel Member	Chemical analysis of the waste has not identified potential for it to act as a contamination source. Any waste recovered in Brooks Park will be subject to the more stringent cover soils reuse criteria  The impermeable layer across Brooks Park in Phase 1 SIW, is required to prevent rainfall potentially mobilising contaminants in underlying soils to groundwater, rather than being necessary to protect underlying groundwater from the waste used as a plan growth medium.
	Rainfall-driven migration of contamination to shallow groundwater via area not underlain by impermeable barrier at SIW Phase 2 area	Shallow Secondary A Aquifer in the Kempton Park Gravel Member	Chemical analysis of the waste has not identified potential for it to act as a contamination source
	Rainfall-driven migration of contamination to shallow groundwater in landscaped Edmonton Marshes	Shallow Secondary A Aquifer in the Kempton Park Gravel Member	Chemical analysis of the waste has not identified potential for it to act as a contamination source
	Surface run-off and dust emissions from	Visitors to the Permitted Site and	Completed area will be capped with hardstanding, buildings and new soft landscaping which will break



Source	Pathway	Receptor	Mitigation
	emplaced soils	surrounding area	linkages between soils and human health receptors
Existing shallow soils and groundwater contamination	shallow soils migration of Secondary A and contamination to Aquifer in the groundwater shallow groundwater Kempton Park	Secondary A Aquifer in the Kempton Park	Remediation of existing contamination as set out in ARUP remediation strategies
			Furthermore, the new sustainable drainage installed will be lined to prevent infiltration to potentially contaminated surrounding ground.
		Naturalised Pymmes Brook and Brook Park landscaping at the Phase 1 SIW area will be underlain by an impermeable barrier and hydraulic cut off wall to prevent downward migration of surface water and subsequent mobilisation of contamination to shallow groundwater.	
	Rainfall-driven migration of contamination to shallow groundwater in landscaped Edmonton Marshes	Shallow Secondary A Aquifer in the Kempton Park Gravel Member	Significant contamination has not been identified in the Edmonton Marshes area of the site. As such, installation of a liner to prevent rainwater infiltration is not considered necessary here due to lack of an in-situ contamination source.

### 4.3 The Priority Contaminants to be Modelled

Numerical modelling is considered unnecessary for this assessment for the reasons set out above.

### 4.4 Review of Technical Precautions

The inclusion of mitigation measures such as capping, a liner or leakage detection, leachate drainage system, leachate head control or groundwater and surface water management for the protection of groundwater are considered not necessary. Details of waste acceptance procedures and criteria are provided in the WAP.

During waste placement (earthworks) operations, control measures will be in place to prevent surface water runoff leaving the Permitted Site. These measures are detailed in the CEMP prepared for the works.

### 4.5 Numerical Modelling

Numerical modelling is considered unnecessary for this risk assessment. The remaining subsections are therefore not completed.

- Justification for Modelling Approach and Software
- Model Parameterisation
- Sensitivity Analysis
- Model Validation
- Accidents And Their Consequences

#### 4.6 Emissions to Groundwater

Due to the lack of contamination identified within the waste, which will be further confirmed through the waste acceptance procedures to be put in place for the works, emissions to groundwater hazardous or non-hazardous substances from the recovered waste are not anticipated during the earthworks or in the completed development.



### 4.7 Hydrogeological Completion Criteria

During the earthworks, the waste placement activities will be managed to prevent contamination of ground or surface waters. Due to the nature of the waste, leachate will not arise and so will not require active management either during the earthworks or beneath the completed development. As such, no hydrogeological completion criteria are proposed, however a period of post works monitoring of groundwater is required to satisfy planning controls as detailed in Section 5.



## 5. Requisite Surveillance

### 5.1 The Risk Based Monitoring Scheme

A monitoring scheme for groundwater and surface water quality across both the SIW and wider Meridian Water Masterplan area has been devised as part of planning controls over future development of this area. The scheme is set out in the Waterman Controlled Waters Monitoring and Maintenance Plan provided for reference with the EP application. The monitoring locations set out in the plan target both shallow and deep groundwater, along with surface waters at the River Lea Diversion Channel, River Lee (Navigation), Pymmes Brook and Salmon Brook. As such, these proposed monitoring locations are also considered suitable for monitoring to confirm the recovery and use of waste at the SIW is not causing detriment to these water bodies.

### 5.1.1 Leachate Monitoring

Leachate monitoring is not required.

#### 5.1.2 Groundwater Monitoring

The objective for groundwater monitoring is to determine that chemical quality within the shallow and deeper aquifers is not being adversely impacted by emplacement of the waste. This will be achieved by a regime of groundwater sampling at existing wells present across the Site, targeting both the shallow aquifer in the Kempton Park Gravel Member, and deeper aquifer in the Thanet Formation and Chalk Group.

As groundwater within the Lambeth Group was found not to form a consistent water body across the Permitted Site and wider Masterplan area, monitoring of this stratum is considered unnecessary.

#### Kempton Park Gravel Member

Previous monitoring of this stratum did not identify a consistent single flow direction, with groundwater levels generally highest in the central area at DZ4 and DZ5, trending downwards to the edges of the Site. Therefore, a series of eleven existing wells have been selected for monitoring centred around DZ4/DZ5, extending outwards to the surrounding wider masterplan area.

#### Thanet Formation / Chalk Group

Previous monitoring has determined the deep groundwater flow direction trend to be south-west to northeast across the Site. Therefore, a series of eight existing wells have been selected up-gradient, midgradient, and down-gradient for this water body.

The installation and locations of the monitoring wells relative to the Site are set out in Table 9. A plan showing the location of the selected wells is included in Appendix A (reproduced as D-ESSD10C) with associated borehole logs included in Appendix B.

Table 9: Monitoring Well Installation and Design for Groundwater Wells

Monitoring Well Up / down hydraulic gradie		Ground Level (m OD)	Installation Details (screening section m bgl / m OD)
Kempton Park Gravel Member Secondary A Aquifer			
D74 BU2020	Up-gradient	+9.72	2.4 to 7.55m bgl
DZ4_BH2029			+7.32 to +2.17m OD
DZ7_BH2053	Mid-gradient	+11.19	13.6 to 14.6m bgl
DZ1_B112000			-2.41 to -3.41m OD
DZC DUQQCCA	Mid-gradient	+10.94	3.6 to 6.7m bgl
DZ6_BH2066A			+7.34 to +4.24m OD



Monitoring Well	Up / down hydraulic gradient	Ground Level (m OD)	Installation Details (screening section m bgl / m OD)
DZ5_BH2022A	Mid-gradient	+9.59	1 to 3.5m bgl +8.59 to +6.09m OD
DZ5_BH2023	Mid-gradient	3 to 6.3m bgl +10.8 +7.8 to +4.5m OD	
DZ4_BH2048 (Deep)	Down-gradient	5.0 to 8.5m bgl +6.37 to +2.87m OD	
DZ7_BH2049	Down-gradient	+11.42	5.5 to 6.8m bgl +5.92 to +4.62m OD
DZ7_BH2054	Down-gradient	+11.59	3.4 to 6.9m bgl +8.19 to +4.69m OD
DZ7_BH2058	Mid-gradient	+10.47	3.2 to 6.8m bgl +7.27 to +3.91m OD
DZ6_BH2069	Down-gradient	+10.68	3.2 to 6.1m bgl +7.48 to +4.58m OD
DZ4_BH2034 (Shallow)	Down-gradient	+10.71	3.6 to 7m bgl +7.11 to +3.71m OD
DZ5_BH2016	Down-gradient	+10.65	3.6 to 7.2m bgl +7.05 to +3.45m OD
DZ6_BH2068	Down-gradient	+10.34	3 to 7.3m bgl +7.34 to +3.04m OD
Thanet Formation / Chalk Gro	oup Principal Aquifer		
DZ4_BH2047	Up-gradient	+11.76	41 to 46m bgl -29.24 to -34.24m OD
DZ4_BH2034 (Deep)	Up-gradient	+10.71	21 to 23m bgl -10.29 to -12.29m OD
DZ6_BH2070	Up-gradient	+10.61	41 to 45m bgl -30.39 to -34.39m OD
DZ6_BH2067	Up-gradient	+10.19	41 to 45m bgl -30.81 to -34.81m OD
DZ7_BH2056	Mid-gradient	+10.57	38 to 43m bgl -27.43 to -32.43m OD
DZ5_BH2015	Down-gradient	+10.53	34.5 to 39.5m bgl -23.97 to -28.97m OD
DZ7_BH2050	Down-gradient	+11.56	39.5 to 44.5m bgl -27.94 to -32.94m OD
DZLV1_BH2071	Down-gradient	+12.31	44 to 48m bgl -31.69 to -35.69m OD



#### Maintenance of Monitoring Wells

Monitoring wells will be protected by concrete rings painted red and white in working areas. If wells become unusable, they will be decommissioned in accordance with EA best practice guidance. Replacement monitoring wells will be positioned as close as possible to the previous well and installed with a similar monitoring well design. Details of the geology encountered during progression of the replacement monitoring wells and the installation design will be recorded and submitted to the EA (local area groundwater team) to demonstrate the replacement well is suitable for continued monitoring.

#### Monitoring Methodology

Ahead of sampling at each monitoring location, the depth to groundwater and depth to base of well will be measured using a dip meter to an accuracy of 0.01m.

Following this, groundwater samples will be taken using a low flow methodology (peristaltic pumps/bladder pumps) to ensure representative groundwater samples are recovered. Excessive purging will not be undertaken prior to sampling to avoid high levels of disturbance on the strata surrounding the well which may mobilise sediments and/or contaminants which would otherwise remain immobile.

Dedicated tubing will be used for each monitoring well, with the tubing tip positioned at the midpoint of the well response zone.

The groundwater samples will be collected once the following parameters detailed in Table 10 have been met or following at least ten minutes of continuous parameter monitoring.

Table 10: Low Flow Monitoring Stabilisation Parameters

Parameter Stabilisation Levels	
Dissolved Oxygen ±10% of reading or ±0.2mg/l, whichever is greater	
Total Dissolved Solids	±10% of reading
Turbidity	±10% of reading
рН	±0.2 pH units
Eh or ORP	±20mV
Conductivity	±3% of reading

Once the stabilisation parameters have been met the groundwater samples will be placed in sampling containers appropriate for the required testing. The sampling containers will be stored in insulated boxes with cool packs and delivered to the laboratory to ensure samples are not marked as deviant by the testing laboratory. UKAS accredited laboratories will be used for the chemical analysis of water samples. Testing will be to the Environment Agency Monitoring Certification Scheme (MCERTS) standards.

### 5.1.3 Surface Water Monitoring

The objective for surface water monitoring is to demonstrate that that chemical quality within these water bodies is not being impacted by surface run-off, or lateral contamination migration through groundwater. Targeted surface water sampling will be completed alongside the proposed groundwater sampling.

### River Lea Diversion Channel, River Lee (Navigation) and Pymmes Brook

A total of ten locations will be sampled each monitoring round (encompassing up-stream, mid-stream and down-stream of all rivers). Locations are set out in the plan in Appendix A.



Table 11: Monitoring Locations for Surface Waters

Monitoring Well	Up / downstream	Ground Level (m OD)	Installation Details (screening section m bgl / m OD)
Pymmes Brook and Salmon B	Brook Surface Waters		
DZ5_SW01	Up-stream	N/A	N/A
DZ5_SW02	Up-stream	N/A	N/A
DZ4_SW03	Mid-stream	N/A	N/A
DZ4_SW04	Down-stream	N/A	N/A
River Lea Diversion Channel			
DZLV1_SW08	Up-stream	N/A	N/A
DZLV1_SW09	Mid-stream	N/A	N/A
DZ6_SW10	Down-stream	N/A	N/A
River Lee (Navigation)			
DZ7_SW05	Up-stream	N/A	N/A
DZ4_SW06	Mid-stream	N/A	N/A
DZ4_SW07	Down-stream	N/A	N/A

#### Monitoring Methodology

Surface water samples will be obtained through direct collection into the sampling containers using a telescoop or similar device.

The surface waters will be inspected daily, and records kept of observations of the visual quality of the water.

UKAS certified laboratories will be used for the chemical analysis of water samples. Testing will be to the Environment Agency Monitoring Certification Scheme (MCERTS) standards.

#### 5.2 Monitoring and Testing Regime

For all groundwater and surface water monitoring points, the regime of testing will be undertaken as follows:

- Two rounds completed at monthly intervals prior to earthworks (excavation, material movements and re-levelling) commencing to form a baseline;
- Quarterly monitoring throughout the duration of the SIW earthworks; and
- Three rounds monthly on completion of the SIW earthworks.

The purpose of the monitoring will be to demonstrate the works have not caused a deterioration in groundwater quality down hydraulic gradient of the Permitted Site. The contaminant threshold concentrations will therefore be dependent on the background groundwater quality as recorded during the baseline monitoring and in monitoring wells up hydraulic gradient of the Permitted Site during each monitoring event. Higher contaminant concentrations within down hydraulic gradient boreholes will signify a potential impact on the surrounding groundwater quality is being caused, and mitigation measures may be required. For each contaminant the following assessment criteria will also be used:

 For hazardous pollutants as classified in the Water Framework Directive, the trigger value will be set at the maximum concentration recorded in up hydraulic gradient monitoring points at each monitoring event;



 For non-hazardous/unclassified pollutants as classified in the Water Framework Directive, the trigger value will be set at 125% of the maximum concentration recorded in up hydraulic gradient monitoring points, at each monitoring event;

The trigger values will be used as a test for deviations from the baseline groundwater conditions and will be regarded as an early warning system to enable the appropriate investigation and corrective measures to be implemented.

Turbidity will be measured on-Site during sampling, with the results confirmed in an ex-situ sample tested in the laboratory.

Adherence to the trigger values identified for each monitoring event in down hydraulic boreholes will ensure the following:

- Hazardous substances are not released during construction;
- An upward trend in non-hazardous contaminants is not realised;

Contaminants included in the testing regime during the baseline monitoring and each monitoring event are included in Table 12.

Table 12: Contaminant Sampling Suite

Group	Contaminants
Organic Compounds	Total Petroleum Hydrocarbons (Aliphatic and Aromatic, C5-C35), to include Benzene, Toluene, Ethylbenzene, Xylenes;
	Polycyclic Aromatic Hydrocarbons; Phenol; PCBs; VOCs
Inorganic Compounds	Ammonia; Ammoniacal Nitrogen as N; Total Alkalinity as CaCO <sub>3</sub> ; Total Cyanide; Free Cyanide; Sulphide; Sulphate.
Metals	Arsenic; Barium, Beryllium Cadmium; Chromium III, Chromium IV; Lead; Copper Mercury; Molybdenum, Nickel Selenium; Vanadium; Zinc
Water Quality Indicators	pH; Chemical Oxygen Demand, Turbidity

#### 5.3 Reporting

The results will be reported to the Environment Agency (local area groundwater team<sup>2</sup>) three weeks after each monitoring round. On completion of all monitoring, a final factual report will be prepared including all in-situ and laboratory test results.

The submitted report will factually present the results, any amendments to the construction methodology, a general summary of activities undertaken on the Permitted Site and relevant activities up hydraulic gradient of the Permitted Site which could have impacted the groundwater monitoring results. Where necessary an interpretation of the results will be completed.

The data will also be included in the EP surrender report.

<sup>&</sup>lt;sup>2</sup> Data will also be submitted if required by EP condition to the relevant team.



### 6. Conclusions

### 6.1 Compliance with the Landfill Directive

The Landfill Directive is not applicable as this is an application for a permanent deposit of recovered waste.

### 6.2 Compliance with the Groundwater Regulations (2009)

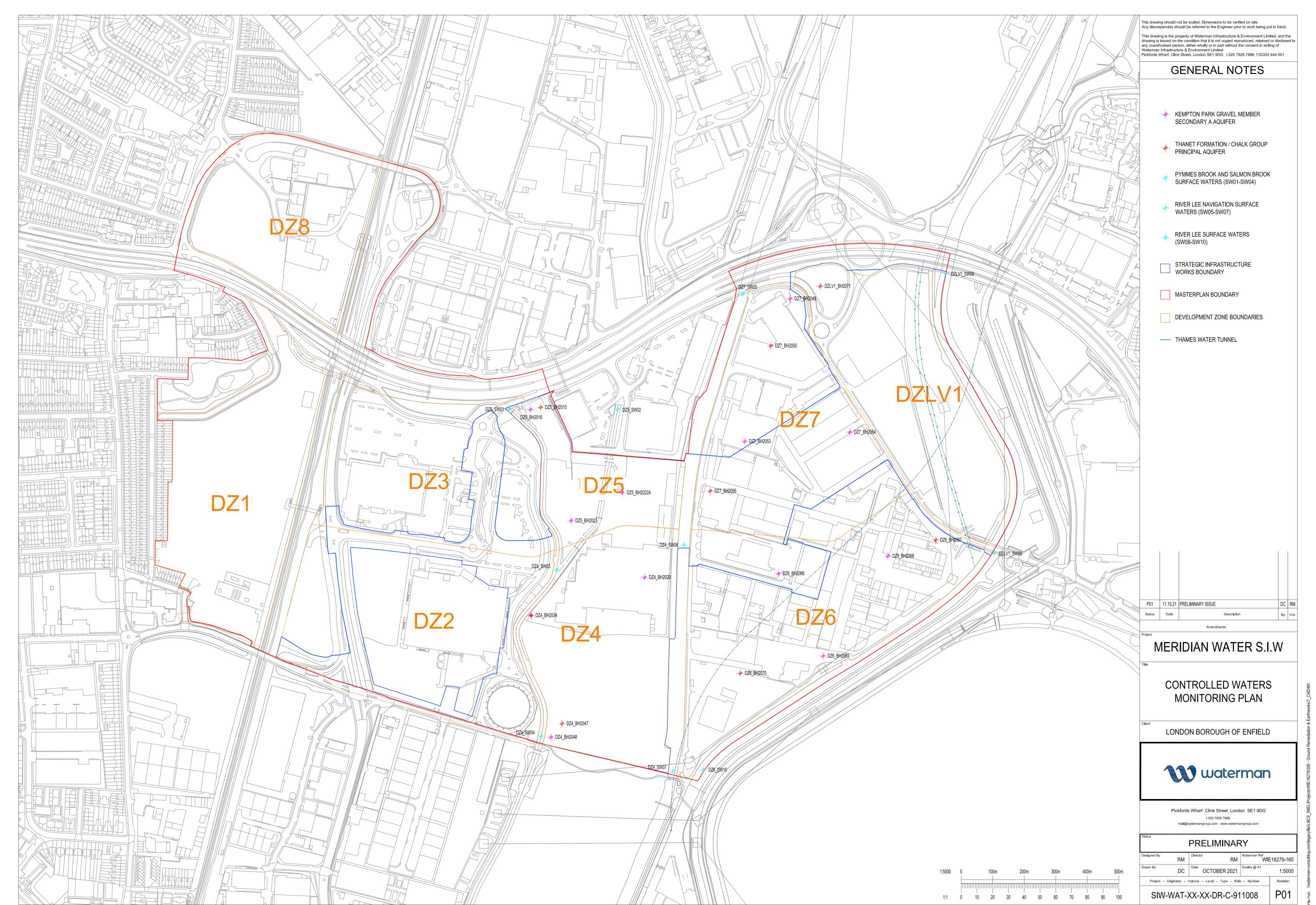
The recovered waste will not pose a threat to groundwater and surface water due to the absence of any complete source-pathway-receptor linkages to identified receptors.

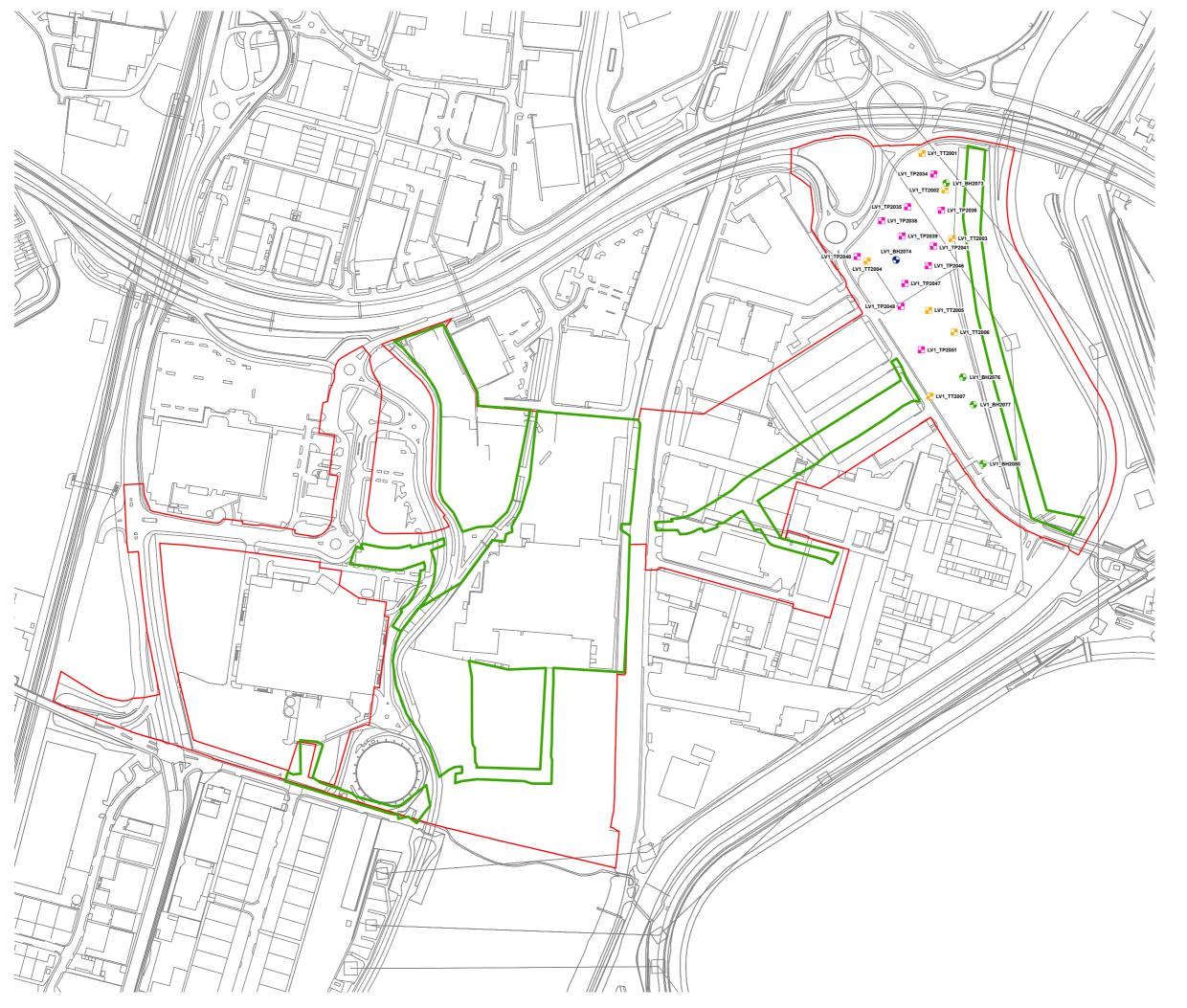


# **APPENDICES**

### A. Site Plans

- Proposed groundwater and surface water monitoring locations plan
- Previous ground investigation monitoring well locations relevant to the SIW
- Previous ground investigation locations with soil chemical quality data completed within the historical landfill area







SIW Boundary

**Environmental Permit Boundary** 

### **Previous Ground Investigation**

- Chalk Installation
- KPGR Installation
- Trial Pit
- Trial Trench





Project Details

WIE16279-300: Meridian Water SIW

Figure Title

Date

Figure B1: Previous investigation locations with soil chemical quality data completed within the historical landfill area

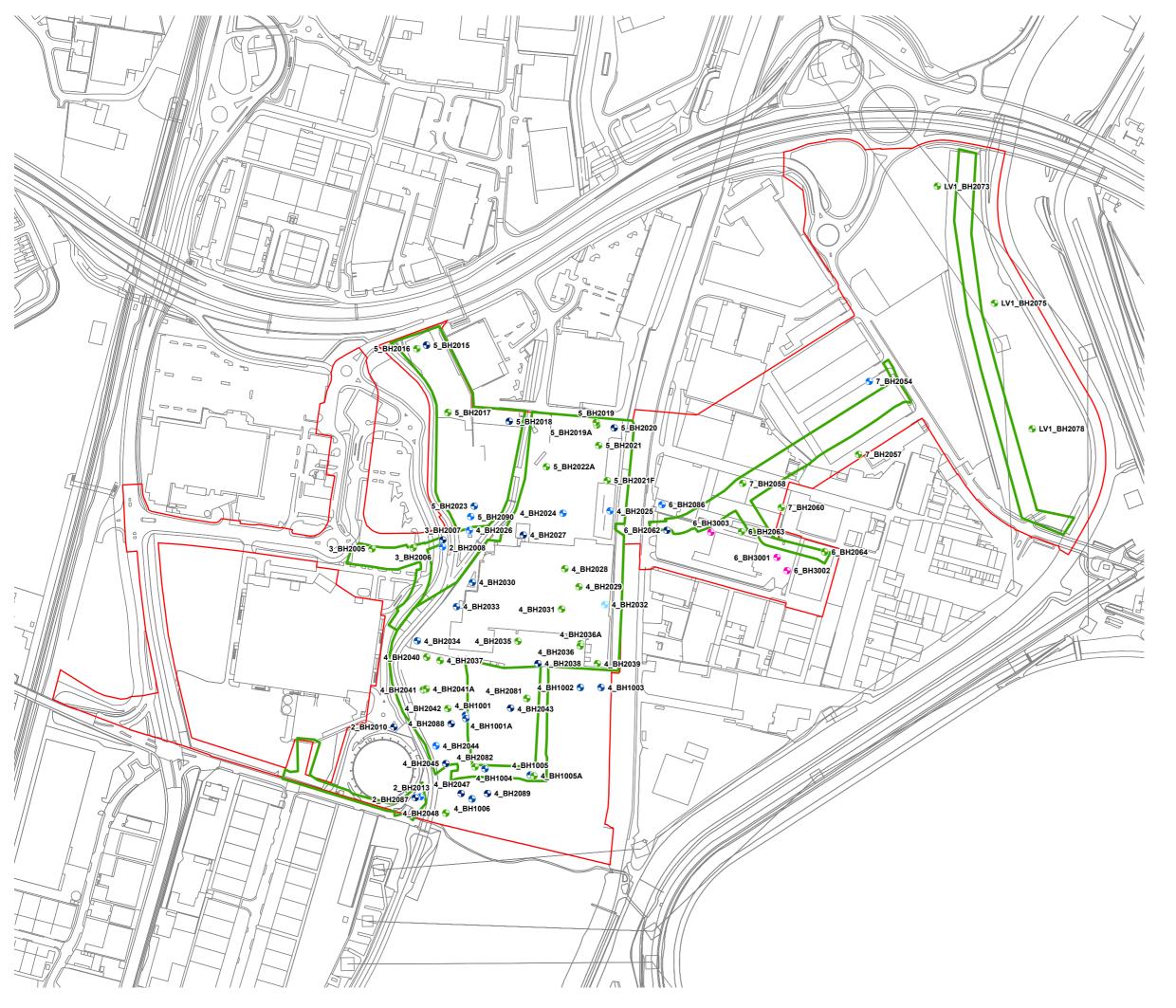
Figure Ref

File Location

March 2024 N:\Projects\WIE16279-300\9\_GIS\WIE16279-300\_GIS\_LQD

WIE116279-300\_GIS\_HRA\_2B

www.watermangroup.com





SIW Boundary

Environmental Permit Boundary

## **Previous Ground Investigation**

- Chalk Installation
- BWB KPGR & Lambeth Group Installation
- KPGR Installation
- Lambeth Group Installation
- KPGR & Lambeth Group Installation
- SLR Borehole





Project Details

WIE16279-300: Meridian Water SIW

Figure Title

Date

Figure A1: Previous Ground Investigation Locations relevant to SIW

Figure Ref

WIE116279-300\_GIS\_HRA\_1B

March 2024

File Location

N:\Projects\WIE16279-300\9\_GIS\WIE16279-300\_GIS\_LQD

www.watermangroup.com



## **B.** Exploratory Hole Records

Exploratory hole logs for wells to be used for groundwater monitoring

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 17/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535896.64 N191985.98 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: DB Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI DZ7 BH2085 CP 11.44m AOD AM+Del Bowman 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Concrete / hardstanding. [MADE GROUND] 0.30 ES 0.30 11.44 Soft, dark grey, sandy, slightly gravelly clay. Gravel is 0.30 - 0.52В angular to subrounded, fine to medium, flint, brick, 0.30 PID PID = 4 ppm quartzite. 0.50 11.14 [MADE GROUND] Dark grey clayey, very sandy gravel. Gravel is angular to subrounded, flint and quartz. 0.70 ES 0.70 PID PID = 1 ppm [MADE GROUND] 0.75 - 1.00В 1.00 10.94 Grey, slightly dayey, gravelly, fine to coarse SAND. 1.05 ES [MADE GROUND] 1.05 - 1.20 В 1.05 PID PID = 0 ppm 1.50 - 2.00 10.44 1.50 Soft, blueish grey mottled brown, slightly gravelly 1.50 **cSPT** N=2 (1,0/1,0,1,0) CLAY. Gravel is angular to subrounded, fine to coarse, flint, quartzite and concrete. Frequent decaying rootlets (<2mm). [MADE GROUND] 2 В 2.40 9.94 2.40 Soft, blueish grey mottled brown, slightly peaty CLAY. 2.50 ES Frequent decaying rootlets (<2mm). 2.50 - 2.95 2.50 - 3.00 D [ALLUVIUM] B SPT N=4 (1,1/1,1,1,1) 2.50 2.50 PID PID = 1 ppm 3.00 9.04 Soft, dark grevish brown, slightly sandy, slightly gravelly, peaty CLAY. Gravel is subangular to subrounded, fine to medium, flint and extremely weak siltstone. Sand is fine to coarse. [ALLUVIUM] 3.50 - 3.95UT

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

3.40 200 3.00 200

5

### Remarks

4.50 - 4.95

4.50 - 5.00

4.50

5.00

D

B

SPT

EW

N=0 (1,0/0,0,0,0)

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 1.40 m to 3.40 m.
 Single install with 50 mm pipe. Response zone from 6.10 m to 8.10 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 17/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535896.64 N191985.98 Project No.: GTS-19-250 Crew Name: DB Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 1:25 GI\_DZ7\_BH2085 CP 11.44m AOD AM+Del Bowman Sheet 2 of 2 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 5.00 EW Soft, dark greyish brown, slightly sandy, slightly gravelly, peaty CLAY. Gravel is subangular to subrounded, fine to medium, flint and extremely weak siltstone. Sand is fine to coarse. [ALLUVIUM] 5.50 - 5.95 UT 6.00 EW В 6.10 8.44 Dense multicoloured, very sandy GRAVEL. Gravel is Added 6.20 ES angular to rounded, fine to coarse, flint and quartzite. =250 | PID PID = 0 ppm Sand is fine to coarse. **IKEMPTON PARK GRAVEL FORMATION** 7.00 EW EW 7.00 7.00 - 7.50 B 7.00 cSPT N=32 (2,3/5,5,9,13) 8.10 В 8.10 5.34 Stiff, fissured, dark grey, slightly sandy CLAY. Sand is fine to medium. Fissures are 5-10 degrees, undulating, rough. Frequent light grey sand / silt 8.30 partings 8.30 PID PID = 0 ppm[LONDON CLAY FORMATION] 8.50 - 8.95 UT 8.95 - 9.00 D single pyritized nodule (<50mm) at 8.95 m. 9 9.10 3.34 End of Borehole at 9.10m

### Remarks

Depth Base

Hole Diameter

Diameter

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 1.40 m to 3.40 m.
 Single install with 50 mm pipe. Response zone from 6.10 m to 8.10 m.

Depth Top Depth Base Duration

Chiselling

Tool

Casing Diameter

Diameter

Depth Base

10

Orientation

Inclination and Orientation

Depth Top | Depth Base | Inclination

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 - 24/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535915.31 N192033.49 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: NC Drilling Equipment: Dando 2000 | Hand Tools Borehole Number Hole Type Level Logged By Scale Page Number GI DZ7 BH2084 CP 11.45m AOD AB 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Reinforced CONCRETE. [MADE GROUND] 0.28 - 0.40В 0.28 11,45 Stiff brown mcttled dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine 0.28 - 0.40 D 0.40 11.17 0.30 ES to coarse flint brick and concrete. 0.30 PID PID = 0 ppm [MADE GROUND] 0.40 - 0.60В Stiff dark brown mottle dark grey to black slightly 0.40 PID PID = 0 ppm gravelly sandy CLAY. Sand is fine to coarse. Gravel is 0.50 ES subrounded to subangular fine to coarse brick, 0.50 - 0.80В 0.80 11.05 concrete with ash. 0.50 - 0.80[MADE GROUND] 0.50 PID PID = 0 ppm Firm dark greenish grey slightly sandy slightly gravelly 0.60 - 0.80 В silty CLAY. Sand is fine. Gravel is angular to 0.60 PID PID = 0 ppmsubangular fine and medium flint. Hydrocarbon odour. 0.80 - 1.10 0.80 - 1.10 В [ALLUVIUM] В 0.80 - 1.10D 0.80 PID PID = 0 ppm1.00 ES 1.00 PID PID = 0 ppm1.10 - 1.20 B 1.10 PID PID = 0 ppm 1.20 - 1.65 D 1.20 - 2.00 1.20 - 2.00 В D 1.20 SPT N=4 (1,0/1,1,1,1) silty from 1.95 to 2.00 m. 1.30 - 3.20 В 1.50 - 1.60 D 1.50 PID PID = 1 ppm 2.00 ES 2.00 - 2.50 UT 2.00 PID PID = 1 ppm peat lens from 2.40 to 2.50 m. 2.50 D gravelly between 2.50 and 2.70 m. 2.50 - 2.60 D 2.50 - 3.00 В 2.50 - 3.00D 2.50 PID PID = 1 ppm 3.00 ES 3.00 - 3.45 D 3.00 - 4.00 B thickly laminated between 3.15 and 3.20 m. 3.00 - 4.00D 3.00 SPT N=4 (1,0/1,1,1,1) 3.00 PID PID = 2 ppm 4.00 4 4.00 ES 4.00 - 4.45 D 4.20 10.65 4.00 SPT N=20 (1,1/1,4,7,8) Medium dense dark grey and brown sandy GRAVEL. 4.00 PID PID = 1 ppm Sand is medium and coarse. Gravel is subangular to 4.05 EW subrounded fine to coarse flint. 4.20 - 5.00 В [KEMPTON PARK GRAVEL FORMATION] 4.20 - 5.00 D

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

1.80 200 1.80 200

5

### Remarks

4.50

4.50

4.55 - 5.00

4.55

5.00

ES

PID

D

EW

PID = 10 ppm

N=19 (3,5/5,4,5,5)

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 0.80 m to 1.80 m.
 Single install with 50 mm pipe. Response zone from 4.20 m to 8.40 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 - 24/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535915.31 N192033.49 Project No.: GTS-19-250 Crew Name: NC Drilling Equipment: Dando 2000 | Hand Tools Borehole Number Hole Type Level Logged By Scale GI\_DZ7\_BH2084 CP 11.45m AOD AB 1:25 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Results Type 5.00 - 6.00 Medium dense dark grey and brown sandy GRAVEL. Sand is medium and coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION] 5.50 - 6.00 D 6.00 6.00 EW 6.00 EW 6.00 EW 6.00 EW 6.00 - 6.45 6.00 - 7.00 D B 6.00 SPT N=26 (5,5/10,6,5,5) 6.00 PID PID = 2 ppm 6.50 EW 6.50 - 7.00 7.00 ES 7.00 - 7.45 7.00 - 8.00 D В 7.00 SPT N=25 (5,6/5,7,6,7) 7.00 PID PID = 2 ppm 7.50 - 8.00D 8.00 - 8.10 8.00 - 8.45 ES D 8.00 SPT N=24 (5,5/6,7,5,6)

Page Number

Sheet 2 of 2

6

9

10 Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

8.00

8.70 - 8.80 8.70

PID

PID

PID = 1 ppm

PID = 1 ppm

8.30

9.40

7.25

3.15

Stiff dark greysh brown sandy CLAY. Sand is fine to

End of Borehole at 9.40m

[LONDON CLAY FORMATION]

 Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 0.80 m to 1.80 m.
 Single install with 50 mm pipe. Response zone from 4.20 m to 8.40 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535747.30 N191884.16 Project No.: GTS-19-250 Crew Name: Drilling Equipment: Hand Tools | Archway Dart Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ6\_WS2086 WS 10.41m AOD 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Reinforced concrete. [MADE GROUND] 0.20 10.41 Soft dark greyish brown slightly sandy slightly gravelly clay. Gravel is angular to rounded fine to coarse, metal, flint, brick and concrete. Sand is fine to coarse. [MADE GROUND] 1.00 10.21 Brown clayey sandy GRAVEL. Sand fine to coarse. Gravel angular to subrounded fine to coarse flint brick and clinker. 1.20 - 1.40 ES [MADE GROUND] 1.20 - 2.00black slightly clayey from 1.26 to 1.58 m. PID PID = 3 ppm 1.58 9.41 Soft grey and black sandy CLAY with possible decayed textile material giving rise to apparent lamination, Sand fine to coarse, [MADE GROUND] 8.83 1.84 firm dark brownish grey slightly gravelly clay with shell fragments (20 mm) between 1.73 and 1.84 m. Gravel is angular fine and medium flint and glass. 2.00 - 3.00 Firm brownish grey slightly organic CLAY with 2.10 - 2.30 ES extremely closely spaced brown silt partings and root PID PID = 45 ppm 2.10 traces infill from strata above from 2.00 to 2.36 m. dark grey organic with occasional white shell Yragments (<2 mm) between 2.36 and 2.64 m. frequent decayed roots between 2.44 and 2.64 m. 3.00 8.57 3 End of Borehole at 3.00m 4 Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling techniques



## **Photographic Report**

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ6\_WS2086

Project ID:

GTS-19-250



WS2086 1 - 3

#### Trial Pit Log Project Name: Meridian Water HIF and Date: 27/07/2021 - 28/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535842.72 N191852.54 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ6\_TP2069 TP 10.42m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.42 Reinforced concrete with rebar. [MADE GROUND] 0.20 10.22 Greyish brown, fine to coarse, sand and gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, ASESTOS PIPE, coal ash, brick, concrete, metal, plastic and glass. High cobble and boulder content of subangular to subrounded ASBESTOS 0.50 В PIPE, concrete and brick. Frequent pockets of clay 0.50 ES (<0.2m). 0.50 PID PID=1.30 [MADE GROUND] 1.00 D 1 1.00 ES PID=1.50 1.00 PID concrete from 1.20 to 1.35 m. 1.50 8.92 Soft to firm, fissured, greenish grey CLAY. Fissures are randomly oriented, planar and polished. Frequent brown iron oxide staining. Slight organic odour. 1.70 В [ALLUVIUM] 1.70 ES PID PID=1.20 2 240 8.02 Soft, greenish grey mottled brown, silty CLAY. [ALLUVIUM] 2.50 D From 2.70m: Peaty clay with frequent lenses of fibrous peat (<0.2m). peaty clay with frequent lenses of fibrous peat 2.80 D (<0.2m) from 2.70 to 3.20 m. 2.80 ES 2.80 PID PID=0.00 3 3.20 7.22 Brown, gravely, fine to coarse SAND. Gravel is angular to rounded, fine to medium, flint and quartzite. [KEMPTON PARK GRAVEL FORMATION] В 3.30 7.02 3.40 Brown mottled grey, sandy GRAVELS. Gravel is angular to rounded, fine to coarse, flint and quartzite. 3.50 B 3.50 [KEMPTON PARK GRAVEL FORMATION] End of Trial Pit at 3.50m 3.50 ES PID=0.70 PID 4

Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 Stable Groundwater struck at 3,30 m. 0.60 Weather

### Remarks

Position scanned using a CAT prior to digging.
 Surface concrete broken out by JCB.
 Trial pit back filled with arising and compacted in 300 mm layers.



## **Photographic Report**

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ6\_TP2069

Project ID:

GTS-19-250





1. Prior to excavation

2. Broken out



# Shallow Borehole Log

structure	Ground Inves	tigatio	81	lient: London			den-	Date: 25/07/2021 - 27/07/2021				
ation: Mer	idian Water, E	nfield		ngineer: Grou imited	ina rechr	lology Ser	vices	Co-ords: E535741.76	N191875.10			
ect No. : 0	GTS-19-250		С	rew Name: R	F			Drilling Equipment: H	land Tools   Dando	20		
orehole N	100000000000000000000000000000000000000		e Type CP	Level 10.39m A	OD		ed By / ND	Scale 1:25	Page Numb			
Water	Sample	and In	Situ Testing	Depth	Level	Legend		Stratum Description				
Strikes	Depth (m)	Type	Results	(m)	(m)		7.					
							Reinforced concrete with rebar. [MADE GROUND]					
	0.30 0.30 0.50 0.50		PID = 1 ppm		10.39		Soft dark greyish brown, sandy, gravelly clay. Gravel is angular to rounded, fine to coarse, metal, flint, quartzite, coal ash, brick and concrete. Sand is fine to coarse. [MADE GROUND]					
	1.25	D B										
	1.50 1.70 - 2.00	SPT	N=5 (1,1/1,2,1,	1.70	10.19		<u></u>	MANEA - 100 - 530 - 350				
	2.00	ES			10.10		randomly	sured, brown mottled grey of y oriented planar and smoot bon odour. UM]	CLAY. Fissures are th. Slight			
	2.00	PID	PID = 62 ppn	n I								
	2.25	D										
	2.50 - 2.95 2.50 - 3.00	UT B		2.50	8.69		randomly	ured, greenish grey, silty CU y oriented, planar and smoothon odour.		-		
	2.80 2.80 2.95 - 3.15 3.00 - 3.30	ES PID D B	PID = 56 ppn	3.00	7.89	× alo alo y	[ÁLLUVI					
	3.18 3.19 3.30 3.30 3.45 3.50 3.50 - 4.00	EW ES PID D D	PID = 271 pps N=15 (2,2/2,3,5	3.55	7.39		[ALLUVI		y GRAVEL. Gravel			
	3.50		15 (2,2/2,3,5	.57			odour.	. Sand is fine to coarse. S	16055.00			
	3.85 3.85 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.25 4.50 - 5.00	ES PID EW EW EW EW EW EW EW CSPT	PID = 174 ppr					ON PARK GRAVEL FORM	ATION]			
Hole Diam		Casing	Diameter	Depth Top   Dep	Chisel	ling Duration	Tool	Inclination Depth Top Depth Base	and Orientation	hatio		
n base		2.50	300	очреттор гоер	an Dase	D'AT BOOK	1001	Deptil base	arcanadori Orient	auto		

### Remarks

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using cable percussive techniques to the op of the Thanet Sand Formation. 3. Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m. 4. Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535741.76 N191875.10 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.39m AOD GI\_DZ6\_BH2086 CP AM / ND 1:25 Sheet 2 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Medium dense multicoloured, sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. Strong hydrocarbon 5.25 D [KEMPTON PARK GRAVEL FORMATION] 5.50 - 6.00 5.50 **cSPT** N=22 (3,4/3,5,7,7) 6 6.25 D 6.50 - 7.00 6.50 N=19 (2,3/4,4,5,6) 7.00 6.84 Stiff, fissured, dark grey, slightly sandy, micaceous CLAY. Fissures are randomly oriented, planar and rough. Sand is fine. Occasional light grey fine sand / 7.25 D silt partings (<2mm) 7.30 ES [LONDON CLAY FORMATION] 7.30 PID PID = 11 ppm UT 7.50 - 7.95 7.95 - 8.15 D 8.25 D 8.50 - 9.00 8.50 SPT N=21 (2,3/4,5,5,7) 9 9.25 D

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

7.00 250 7.00 250
8.45 200 8.45 200

10

### Remarks

9.50 - 9.95

9.95 - 10.15

UT

D

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using cable percussive techniques to the top of the Thanet Sand Formation.
 Sand Formation. 3. Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m. 4. Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535741.76 N191875.10 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 1:25 GI\_DZ6\_BH2086 CP 10.39m AOD AM / ND Sheet 3 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Stiff, fissured, dark grey, slightly sandy, micaceous CLAY. Fissures are randomly oriented, planar and rough. Sand is fine. Occasional light grey fine sand / 10.25 D silt partings (<2mm). [LONDON CLAY FORMATION] 10.50 - 11.00 10.50 SPT N=29 (4,5/6,7,8,8) 11.25 D 11.50 - 11.95 UT 11.95 - 12.15 D 12.00 3.39 12 Stiff, fissured, dark grey, slightly sandy CLAY. Fissures are randomly oriented, planar, smooth. Sand is fine. Frequent pockets of fine sandy to very sandy clay 12.25 D [LONDON CLAY FORMATION] 12.50 SPT N=50 (5,8/10,10,11,19) 12.75 -1.61 Very stiff, light greenish grey mottled red brown silty CLAY. [LAMBETH GROUP - UPPER MOTTLED CLAY] 12.95 - 13.00 В 13 13.00 ES 13.00 PID PID = 1 ppm 13.25 D 13.50 - 14.50 13.50 SPT N=35 (7,8/3,8,8,11)14 14.25 D 14.50 - 14.95 UT 14.50 - 15.50 B

# Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

15

### Remarks

14 95

15 00

D

FW

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using cable percussive techniques to the top of the Thanet Sand Formation. 3. Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m. 4. Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535741.76 N191875.10 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.39m AOD 1:25 GI\_DZ6\_BH2086 CP AM / ND Sheet 4 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Very stiff, light greenish grey mottled red brown silty [LAMBETH GROUP - UPPER MOTTLED CLAY] 15.25 D 15.50 - 16.50 15.50 -2.36Very stiff, light grey mottled orange brown slightly 15.50 SPT N=28 (4,4/5,6,8,9) sandy, locally very sandy CLAY. Sand is fine. [LAMBETH GROUP - LOWER MOTTLED CLAY] 16 16.25 D 16.37 EW 16.50 - 16.80 UT 16.50 - 17.50 16.95 D 16.95 -5.11 Very dense light brown grey mottled clayey SAND. 17.00 EW Sand is fine [LAMBETH GROUP - LOWER MOTTLED CLAY] 17.25 D 17.50 - 18.50 B 50 (6.12/50 for 17.50 SPT 225mm) 18.00 FW 18 18.00 EW 18.25 D 18.40 SPT 0 (8,17/0 for 0mm) 18.50 - 19.50 B

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

19

20

### Remarks

19.00

19.00

19.00

19.25

19.50 - 20.50

19.60

EW

EW

EW

D

B SPT

N=50 (4,9/50 for

250mm)

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques to the top of the Thanet Sand Formation.
 Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m.
 Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535741.76 N191875.10 Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.39m AOD GI\_DZ6\_BH2086 CP AM / ND 1:25 Sheet 5 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Very dense light brown grey mottled clayey SAND. [LAMBETH GROUP - LOWER MOTTLED CLAY] 20.25 D 20.50 - 21.50 20.50 SPT N=50 (15,12/50 for 230mm) 21 21.25 D 21.50 - 22.50 21.50 В -6.56 Dense, becoming very dense, dark brownish grey silty 21.50 SPT SAND with burrows infilled (<10 mm) with stiff dark (4,4/5,8,14,14) grey clay and grey sand. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 22 22.25 D 22.50 - 23.50 B SPT 22.50 N=45 (2,5/7.10,12,16) 23 23.25 D 23.50 - 24.50 23.50 SPT N=50 (5,7/11,14,12,13) 24 24.25 D

# Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

25

### Remarks

24.50 - 25.50

В

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using cable percussive techniques to the top of the Thanet Sand Formation. 3. Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m. 4. Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

## Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535741.76 N191875.10 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.39m AOD AM / ND GI\_DZ6\_BH2086 CP 1:25 Sheet 6 of 6 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Dense, becoming very dense, dark brownish grey silty SAND with burrows infilled (<10 mm) with stiff dark grey clay and grey sand. Sand is fine and medium. 25.25 D [LAMBETH GROUP - UPNOR FORMATION] 25.50 - 26.50 В 25.50 -11.11 Dark grey silty SAND with extremely to closely spaced black sandy silt partings and <10mm pockets. Sand fine and medium. [THANET SAND FORMATION] 25.80 25.80 PID PID = 0 ppm 26 26.25 D 26.50 -15.11 End of Borehole at 26,50m 27 28 29

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

30

### Remarks

Position CAT scanned, surface concrete broken out with a JCB and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques to the top of the Thanet Sand Formation.
 Environmental seals installed from 1.50 m to 2.50 m and from 7.00 m to 8.00 m.
 Dual install with 50 mm pipe. Response zones from 3.55 m to 7.00 m and from 17.00 m to 21.50 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 20/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535532.60 N191857.55 Drilling Equipment: Hand Tools | Dando Project No.: GTS-19-250 Crew Name: Terrier Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ5\_WS2090A WS 10.32m AOD 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Concrete. [MADE GROUND] 0.22 10.32 Dark yellowish brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is subangular to rounded flint, brick, and concrete. [MADE GROUND] 0.95 10.10 Firm brown sandy gravelly CLAY. Sand fine to coarse. 1.00 PID PID = 0 ppm Gravel angular to rounded fine to coarse brick concrete and flint. Slight petrol odour. [MADE GROUND] 1.20 ES 1.20 - 2.00 1.35 9.37 Firm slightly greenish grey CLAY with common black rootlets and wood fragments wood fragments have occasional orange tinge. [ALLUVIUM] slight unpleasant odour between 1.35 and 1.60 m. small pyritised wood fragment at 1.39 m. 2.00 - 3.00 L 2 orange mottling between 2.20 and 2.50 m. 2.55 8.97 Plastic very dark brown pseudo-fibrous PEAT with common gravel sized dark brown wood fragments. [ALLUVIUM] black organic clay band between 2.55 and 2.60 m. 2.85 7.77 Thinly laminated dark brownish grey clayey gravelly SAND with common gypsum crystals. Sand is fine to 3.00 7.47 medium. Gravel is fine to coarse angular flint. 3 [ALLUVIUM] End of Borehole at 3.00m 4 Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling

techniques. 3. Hole progressed under specialist Radological supervision engineer owing to site history



Photograp	hic Report
-----------	------------

GI\_DZ5\_WS2090A

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID:

GTS-19-250



WS2090A 1.2 - 3.0



## Shallow Borehole Log

Project Name: Meridian Water HIF and Date: 22/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535533.27 N191857.42 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ5\_BH2090A CP 10.28m AOD JF / ND 1:25 Sheet 1 of 5 Sample and In Situ Testing Water Depth Level Stratum Description Well Legend Strikes (m) (m) Results Depth (m) Type Concrete. [MADE GROUND] 0.22 - 0.95B 0.22 10.28 Dark brown mottled yellowish brown slightly clayey gravelly SAND, Sand is fine to coarse. Gravel is subangular to rounded flint, brick, and concrete. [MADE GROUND] 0.50 - 0.600.50 PID PID = 1 ppm 0.95 10.06 Lightly brown mottled grey slightly silty slightly sandy 1.00 - 1.10 slightly gravelly CLAY. Sand is fine. Gravel is subangular fine to coarse brick and concrete. 1.00 PID PID = 1 ppm D [MADE GROUND] 1.30 - 1.50 B 1.50 - 2.001.50 9.34 Firm to stiff greyish brown slightly gravelly slightly 1.50 N=5 (1,1/2,1,1,1) sandy CLAY. Sand is fine and medium. Gravel is subangular fine flint. [ALLUVIUM] 2 2.20 - 2.30 ES 2.20 PID PID = 0 ppm D 2.40 2.50 - 2.95 UT 3 3.20 - 3.303.20 PID PID = 2 ppm 3.40 D 3.40 8.78 Medium dense brown sandy GRAVEL. Sand is 3.50 - 4.00medium and coarse. Gravel is subangular to 3,50 CSPT N=22 (3,3/3,6,7,6) subrounded fine to coarse flint [KEMPTON PARK GRAVEL FORMATION] 4.20 - 4.30ES 4.20 PID PID = 1 ppm 4.40 D 4.50 EW 4.50 EW 4.50 - 5.00 B 4.50 CSPT N=23 (3,3/5,4,7,7) 5.00 EW 5 Inclination and Orientation Hole Diameter Casing Diameter Chisel Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

### Remarks

 Position relocated from BH2090 which terminated in the hand excavated pit on concrete obstructions.
 Location CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental scals installed from 1.00 m to 3.15 and from 6.40 m to 7.40 m.
 Dual install with 50 mm pipe. Response zones from 3.40 m to 6.25 m and from 16.0 m to 20.50 m.
 Hole progressed under specialist Radiological supervision engineer owing to site history.

## Project No.: GTS-19-250 Borehole Number GI\_DZ5\_BH2090A Water Well Strikes Depth (m) 5.20 - 5.30 5.20 5.40 5.50 - 6.00 5.50

# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535533.27 N191857.42 Location: Meridian Water, Enfield Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Hole Type Level Logged By Scale Page Number CP 10.28m AOD JF / ND 1:25 Sheet 2 of 5 Sample and In Situ Testing Depth Stratum Description Legend (m) (m) Type Results EW Medium dense brown sandy GRAVEL. Sand is medium and coarse. Gravel is subangular to subrounded fine to coarse flint. ES [KEMPTON PARK GRAVEL FORMATION] PID PID = 1 ppm D В dense from 5.50 m. **cSPT** N=32 (5,5/4,6,9,13) 6 6.20 - 6.30 6.25 6.88 6.20 PID PID = 0 ppm Stiff greyish brown laminated CLAY. Laminations are 6.25 - 6.40 D extremely closely spaced thin silt. 6.30 - 6.95 [LONDON CLAY FORMATION] 6.95 - 7.15 UT 7.20 - 7.30ES 7.20 PID PID = 1 ppm D 7.40 7.50 - 8.00 B N=18 (3,3/3,5,5,5) 7.50 SPT 8.20 - 8.30 8.20 PID PID = 0 ppm 8.40 D 8.50 - 8.95 UT 9 9.20 - 9.30ES 9.20 PID PID = 1 ppm 9.40 D 9.50 - 10.00 В 9.50 N=17 (2,4/4,4,4,5)

Inclination and Orientation Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

10

10.00

EW

<sup>1.</sup> Position relocated from BH2090 which terminated in the hand excavated pit on concrete obstructions. 2. Location CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services, 3, Hole completed using cable percussive techniques into the Lambeth Group. 4, Environmental seals installed from 1.00 m to 3.15 and from 6.40 m to 7.40 m. 5. Dual install with 50 mm pipe. Response zones from 3.40 m to 6.25 m and from 16.0 m to 20.50 m. 6, Hole progressed under specialist Radiological supervision engineer owing to site history.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535533.27 N191857.42 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ5\_BH2090A CP 10.28m AOD JF / ND 1:25 Sheet 3 of 5 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Results Type Stiff greyish brown laminated CLAY. Laminations are extremely closely spaced thin silt. [LONDON CLAY FORMATION] 10.20 - 10.30 ES 10.20 PID PID = 1 ppm 10.40 D 10.50 - 10.95 UT EW 11.20 - 11.30 D 11.50 - 11.85 D 11.50 - 12.00 11.50 SPT N=50 (6,7/50 for 200mm) 12 12.40 D 12.50 - 12.95 12.50 - 13.00 D 12.50 4.04 Very stiff, light greenish grey mottled red brown silty B 12.50 SPT N = 39[LAMBETH GROUP - UPPER MOTTLED CLAY] (6,6/8,9,11,11) 12.60 ES 12.80 ES 12.80 PID PID = 0 ppm 13 13.30 D 13.50 13.50 - 14.00 13.50 N=32 (5,6/7,8,8,9) 14 14.30 D 14.50 - 14.95 D 14.50 - 15.00 B SPT 14.50 N=33

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

15

### Remarks

(6,5/7,8,8,10)

Position relocated from BH2090 which terminated in the hand excavated pit on concrete obstructions.
 Location CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.00 m to 3.15 and from 6.40 m to 7.40 m.
 Dual install with 50 mm pipe. Response zones from 3.40 m to 6.25 m and from 16.0 m to 20.50 m.
 Hole progressed under specialist Radiological supervision engineer owing to site history.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 22/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535533.27 N191857.42 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI DZ5 BH2090A CP 10.28m AOD JF / ND 1:25 Sheet 4 of 5 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Results Type Very stiff, light greenish grey mottled red brown silty [LAMBETH GROUP - UPPER MOTTLED CLAY] 15.30 D 15.50 - 15.95 15.50 - 16.00 D В 15.50 SPT N=45 (7,7/8,11,12,14)16 16,30 D 16.50 - 16.85 16.50 - 17.00 D 16.50 -2.22Very stiff, light grey mottled orange brown slightly В sandy CLAY with occasional thin very sandy bands 16.50 SPT N=50 (11,14/50 below 17.5 m. Sand is fine. for 200mm) [LAMBETH GROUP - LOWER MOTTLED CLAY] 17 17.30 D 17.50 FW very sandy from 17.50 to 18.50 m. 17.50 EW 17.50 - 17.95 17.50 - 18.00 D B 17.50 SPT N=50 (25 for 100mm/50 for 150mm) 18 18.30 D 18.50 - 18.95 18.50 Very dense light brown clayey SAND. Sand is fine. 18.50 - 19.00 [LAMBETH GROUP - LOWER MOTTLED CLAY] 18.50 SPT N=50 (5,10/10,13,12,15)

Hole Diameter Casing Diameter Chiselling Inclination and Orientation
Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

-8.22

19

20

Very dense dark greenish grey silty SAND. Sand is

[LAMBETH GROUP - UPNOR FORMATION]

### Remarks

19.30

19.50 - 19.90

19.50 - 20.00

19.50

19.80

19.80

D

D

B

SPT

ES

PID

N=48 (3,9/48 for

250mm)

PID = 0 ppm

19.50

Position relocated from BH2090 which terminated in the hand excavated pit on concrete obstructions.
 Location CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.00 m to 3.15 and from 6.40 m to 7.40 m.
 Dual install with 50 mm pipe. Response zones from 3.40 m to 6.25 m and from 16.0 m to 20.50 m.
 Hole progressed under specialist Radiological supervision engineer owing to site history.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535533.27 N191857.42 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ5\_BH2090A CP 10.28m AOD JF / ND 1:25 Sheet 5 of 5 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Very dense dark greenish grey silty SAND. Sand is [LAMBETH GROUP - UPNOR FORMATION] 20.30 D 20.50 - 20.95 20.50 - 21.00 D В N=50 20.50 SPT (3,3/10,11,14,15) 21 21.30 D 21.50 - 21.85 21.50 - 22.00 21.50 D -9.22 Very stiff thinly to thickly laminated dark brownish grey В CLAY with silty sand laminae, Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 21.50 SPT N=50 (25 for 100mm/50 for 150mm) 22 22.30 D 22.50 - 22.95 N=50 22.50 SPT (7,7/10,11,13,16) 23.00 -11.2223 End of Borehole at 23.00m 24

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

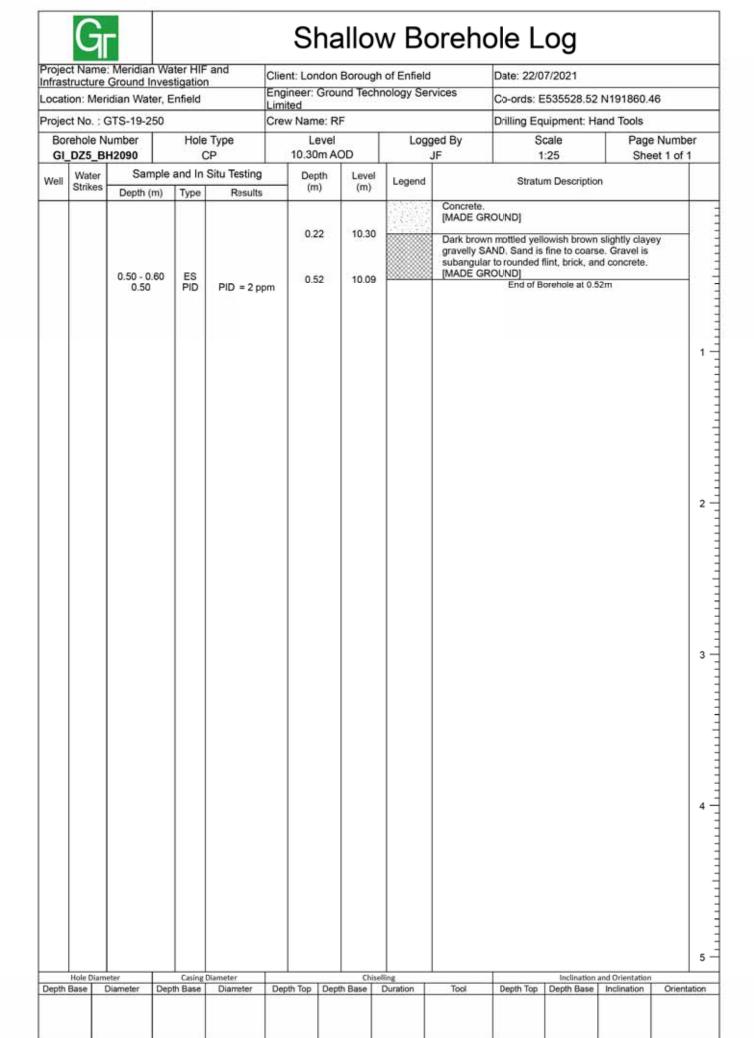
Depth Base Diameter Depth Base Diameter Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

23.00 150 22.00 150

25

### Remarks

Position relocated from BH2090 which terminated in the hand excavated pit on concrete obstructions.
 Location CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.00 m to 3.15 and from 6.40 m to 7.40 m.
 Dual install with 50 mm pipe. Response zones from 3.40 m to 6.25 m and from 16.0 m to 20.50 m.
 Hole progressed under specialist Radiological supervision engineer owing to site history.



### Remarks

Position CAT scanned, cored and inspection pit dug to 0.52 m using hand tools - position clear of services.
 Hole terminated owing to concrete obstructions.
 Hole moved to adjacent location BH2090A.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 02/07/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Logged By Scale Page Number GI\_DZ4\_BH2089 CP+RC 12.14m AOD AB / JF / DW 1:25 Sheet 1 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) Depth (m) Results TOR SCR RQD Type 0.00 - 0.82Grass on light brown very silty slightly sand ES 0.10 CLAY with common fine root. Sand is fine and 0.10 - 0.20D 0.10 PID PID = 1 ppm [MADE GROUND] 0.82 - 1.42В 0.82 Dark brown slightly clayey gravelly SAND 0.90 - 1.00D (12.14)Sand is fine to coarse. Gravel is subrounded to 0.95 ES subangular fine to coarse flint, brick, and 0.95 PID PID = 0 ppm concrete. Slight hydrocarbon odour. [MADE GROUND] geotextile membrane at 0.82 m. 1.40 - 1.50 D Dark brown very clayey sandy gravelly CLAY. 1.42 - 2.29 B (11.32)Sand is fine to coarse. Gravel is subangular to ES subrounded fine to coarse flint, brick, and 1.60 PID = 12 ppm concrete with rare metal and rubber. Hydrocarbon odour [MADE GROUND] 2 2.29 - 2.84 2.30 - 2.40 2.29 Firm light orange brown gravelly sandy CLAY. D (10.72)Sand is fine to coarse. Gravel is subrounded to 2.40 ES subangular fine to coarse flint, brick, concrete 2.40 PID PID = 56 ppm and rubber [MADE GROUND] hydrocarbon odour becoming strong at 2.29 2.84 - 3.00 2.90 - 3.00 B D 3.00 ES 3.00 Firm brown slightly organic CLAY with black 3.00 - 3.45 D (9.85)amorphous peat pockets and hydrocarbon 3.00 - 3.50B odour 3.00 PID PID = 9 ppm [ALLUVIUM] 3.60 - 3.70 3.60 PID PID = 0 ppm D 3.80 - 3.904.00 - 4.504.00 N=11 (1,1/1,2,3,5) 4.60 - 5.60 ES PID = 0 ppm PID 4.60

### Remarks

Depth Base

Hole Diameter

5.00 - 5.45

Diameter

UT

Depth Base

Casing Diameter

Diameter

 Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pit with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe.
 Response zone from 41.10 m to 47.10 m. 7. Hole ground above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Chisel

Tool

5

Drilling Flush

Depth You (in) Depth Seise (m) Flush Type Flush Colour Min (%) Max (%)

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 02/07/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Logged By Scale Page Number GI\_DZ4\_BH2089 CP+RC 12.14m AOD AB / JF / DW 1:25 Sheet 2 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) Depth (m) Type TOR SCR RQD Results Firm brown slightly organic CLAY with black HVP (kPA) =146 5.10 amorphous peat pockets and hydrocarbon 5.10 HVP (kPA) =31 dark grey organic clay from 5.15 to 5.45 m. 5.45 - 5.60 D 5.45 Dark brown to black clayey pseudo fibrous to (9.14)amorphous PEAT. [ALLUVIUM] 5.80 - 5.90 D 6.00 - 6.50 6.00 Medium dense dark grey sandy GRAVEL with 6.00 N=15 (1,2/3,5,3,4) (6.69)hydrocarbon odour and sheen. Sand medium and coarse. Gravel angular to rounded fine to coarse flint [KEMPTON PARK GRAVEL FORMATION] 6.60 ES 6.60 PID PID = 61 ppm 6.80 - 6.90 D slightly sandy from 6.80 to 8.60 m. 7.00 - 7.50 7.00 cSPT N=14 (2,2/3,3,4,4) 7.75 - 7.85D 8.00 - 8.50 8.00 **cSPT** N=19 (4,8/8,4,4,3) 8.20 - 9.70 C 8.60 - 9.00 D Firm greyish brown slightly sandy CLAY with (6.14)black hydrocarbon staining and odour. [LONDON CLAY FORMATION] UT 9.00 - 9.45 9 HVP (kPA) =23 9.10 HVP (kPA) =3 9.10 stiff brown from 9.20 m. 9.45 - 9.60 D 9.70 ES Firm thinly laminated dark grey silty CLAY 9.70 - 11.00 C 9.80 occasional pyrite nodules up to 6mm and thin 9.70 SPT N=25 (2,4/5,6,7,7) (3.54)sandy beds PID PID = 0 ppm 9.70 [LONDON CLAY FORMATION] 10 -Hole Diameter Casing Diameter Chisell **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

### Remarks

 Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pit with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe.
 Response zone from 41.10 m to 47.10 m. 7. Hole ground above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 02/07/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Logged By Scale Page Number GI\_DZ4\_BH2089 CP+RC 12.14m AOD AB/JF/DW 1:25 Sheet 3 of 10 Sample and In Situ Testing Corina Water Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Firm thinly laminated dark grey silty CLAY occasional pyrite nodules up to 6mm and thin sandy beds. [LONDON CLAY FORMATION] 100 10.60 ES 10.60 PID PID = 1 ppm 10.78 - 10.98 CS 11.00 - 12.60 11.00 N=19 (2,3/4,4,5,6) 100 pyrite nodule (6 mm) at 11.87 m. 12 12.07 - 12.33 CS thin sandy bed between 12.08 and 12.09 m. 12.60 - 14.10 SPT N=19 (2,3/3,5,5,6) 12.60 13 100 13.72 - 14.10 CS 13.90 Medium dense dark greyish brown dense 14 clayey SAND with occasional white foraminifera. Sand fine and medium slightly 14.10 - 15.70 SPT glauconitic. 14.10 N=28 [HARWICH FORMATION - SWANSCOMBE (2,4/4,5,9,10) MEMBER] AZCL between 14.10 and 14.58 m. 75 15.00 - 15.25 CS 15 Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%) 1. Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pi; with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe.

Response zone from 41.10 m to 47.10 m, 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 02/07/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Scale Page Number Logged By GI\_DZ4\_BH2089 CP+RC 12.14m AOD AB / JF / DW 1:25 Sheet 4 of 10 Sample and In Situ Testing Corina Water Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Medium dense dark greyish brown dense clayey SAND with occasional white foraminifera. Sand fine and medium slightly [HARWICH FORMATION - SWANSCOMBE MEMBER] DINI between 15.44 and 15.67 m. 15.70 - 17.20 C 15.70 SPT N=40 (2,5/7,9,11,13) 15.90 Dense thinly laminated greenish brownish grey (-1.76)slightly sandy glauconitic SAND with occasional 16 shelly fragments and clay beds. Clay beds are very stiff thinly laminated brownish grey [HARWICH FORMATION - SWANSCOMBE MEMBER] very glauconitic at 15.93 m. 90 very glauconitic band between 16.13 and 16.15 m. brown grey very stiff clay band between 16.65 - 16.95 16.26 and 16.36 m. 16.80 black and white streaked shelly bed between (-3.76)16.76 and 16.80 m. Brownish grey silty SAND. Sand is fine to [HARWICH FORMATION - SWANSCOMBE 17.20 - 18.70 17.20 SPT N=43 pebble bed between 17.23 and 17.28 m. 17.28 (5,7/10,9,11,13) (-4.66)Pebbles are cobbles and coarse gravel rounded black flints. Very stff blueish grey mottled reddish brown to purple and occasionally orangish brown slightly sandy CLAY. Sand is fine and medium. [LAMBETH GROUP - UPPER MOTTLED 17.80 ES CLAY] 103 18 34 - 18 60 CS 18.70 - 20.20 18.70 SPT N=37 (2.5/7.9.9.12)19 113 19.68 - 20.00 CS 20 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

 Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pit with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe.
 Response zone from 41.10 m to 47.10 m. 7. Hole ground above response zone to 0.30 m and grout left to cure before installing headworks.

		: Meridian Ground In				Clie	nt: Lor	don B	oroug	h of Enfiel	d		Date: 02/07/2021 - 16/	07/2021			
		idian Wat				Con		: Grou	nd Te	chnology s	Services	S	Co-ords: E535548.82	N191549.19			
ojec	t No. : 0	GTS-19-2	50			Crew Name: RF+CB+RF / CB							Drilling Equipment: JCB 3CX   Commachio 405				
Borehole Number Hole Type GI_DZ4_BH2089 CP+RC						evel	94		gged By		Scale	Page Numb					
GI_	DZ4_B		_		CP+RC		12.14	m AOI		AB /	JF / DV	N	1:25	Sheet 5 of			
ell	Water Strikes		-		Situ Testing		TOR	Coring		Legend	Depth (Level)		Stratum Descrip	tion			
		Depth (r	m)	Type	Results	9	TOR	SCR	RQD	TUTUTE	Same		stff blueish grey mottled		+		
		20.20 - 21 20.20		C SPT	N=44						20.10 (-5.14)	purple and occasionally orangish brown slightly					
					(3,7/8,10,12,	,14)						CLA	grey mottled purple and or Y. Sand is fine and medius	m.	1		
												[LAN	MBETH GROUP - LOWER Y]	MOTTLED			
												0220	0.0				
												fine b	plack rootlets between 20.87 and 20.95				
							100					m.			2		
											i.						
		21.70 - 23	3,10	С									<u> </u>	2020 000			
		21.70 - 23	3.20	C	N=50 // 18/5	0.600							apping core from 21.7 to comental seal.	o 24.6 to drill out			
		21.70	2.	OF1	N=50 (4,16/5 105mm)							35516.55					
															2		
											22.50 (-7.96)						
							100 95					NO 10 10 10					
													dense light bluish grey m ey SAND. Sand is fine and		-		
													MBETH GROUP - LOWER				
											33.1						
															2		
		23.10 - 24		С	.,	2120	_	_			ia.				-		
		23.10	6	SPT	N=50 (2,17/5 90mm)	0 for			-								
		23.20 - 24	4.70	С	1 40						ja .						
							100										
							67								2		
												habt	le bed from 24.75 to 24	100 m Dobbles			
												are c	obbles and coarse grav	vel rounded			
												occas flints.	sionally angular black o	ccasionally white	3		
		24.70 - 26	8.00	С							S	Very	dense greenish grey clay		1		
		24.70		SPT N=50 (4,8/50 for LAMBETH GROUP - UPNOR FORMATIO					80mm) (mm08	R FORMATION]	1						
					(comm)	6					24.90		lack organic clayey sai and 25.00 m.	nd bed between			
										11.74.15.16.5	(-10.36)	27.00			2		
oth E		Diameter		h Base	Diameter Diameter	Dep	th Top	Depth		elling Duration	Tox	ol	Drillin	ng Flush e Flush Colour Min (%)	Max		
22.4		176		2.40	176		10.000	1									
ma	arks					_		1									

cation oject N		Ground Inve												
			Enfield		Contra		: Grour	nd Tec	chnology s	Services	S	Co-ords: E535548.82 N	1191549.19	
-	No. : 0	STS-19-250					e: RF+	CB+F	RF / CB			Drilling Equipment: JCE 405	3CX   Commac	hio
		umber	Hole Type				evel			gged By		Scale	Page Numb	
7		H2089		+RC Situ Testina	1		m AOD	)	AB /	JF / DV	N	1:25	Sheet 6 of 1	10
	Water Strikes	Depth (m)	Type	Situ Testing Results		TCR	Coring	RQD	Legend	Depth (Level)		Stratum Descripti	on	
		26.00 - 27.50 26.91 - 27.10	С	Results		31	SCR	ROD		26.10 (-12.76)	Stiff grey is fir [LAM	y dense greenish grey claye  ID. Sand is fine and mediur  MBETH GROUP - UPNOR  IL between 25.10 and 26.  Thinly to thickly laminated of a sandy CLAY with silty sand and medium.  MBETH GROUP - UPNOR  IN burrow infill between 2	n. FORMATION] 00 m.  lark brownish d laminae. Sand FORMATION]	2
		27.50 - 29.00 27.50 28.00 28.05 - 28.15	SPT	N=50 (2,5/50 270mm)	322007	77				28.10 (-13.96)	Very	y dense thinly laminated dar	k greenish grey bundant shell	2
	28.05 - 28.	29.00 - 30.50	С			77	,				Oyste	ments. Sand is fine and me MBETH GROUP - UPNOR er shell (70 mm x 40 mm) er fragments between 28.	FORMATION] ) at 28.32 m.	2
						40					frequ	at 29.75 m. ent dark grey clay beds between 29.90 and 30.5		- 3
	ole Diame			Diameter					elling			Drilling		_
epth Bas	se C	Diameter Dep	oth Base	Diameter	Depth	Тор	Depth B	Base	Duration	Tox	ol	Depth Top (m) Depth Sein (m) Flush Type	Flush Colour Min (%)	Max

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 02/07/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Scale Logged By Page Number GI\_DZ4\_BH2089 CP+RC 12.14m AOD AB / JF / DW 1:25 Sheet 7 of 10 Sample and In Situ Testing Corina Water Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type Very dense thinly laminated dark greenish grey clayey glauconitic SAND with abundant shell fragments. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 30.50 - 32.00 30.50 SPT N=50 (4,9/50 for 185mm) 31.03 Dark grey thinly laminated CLAY with abundant (-15.96)clayey sand beds (up to 50 mm) abundant shell fragments and pebbles. Pebbles are fine to 73 coarse predominantly black occasionally dark brown sub rounded flint. [LAMBETH GROUP - UPNOR FORMATION] shelly bed between 31.22 and 31.28 m. 31.68 - 31.91 CS 32.00 - 33.50 32 pebble bed between 32.00 and 32.10 m. 32.00 SPT N=50 (3,7/50 for 32.10 Pebbles are coarse gravel and small 90mm) (-18.89) cobbles, sub rounded flint 32.20 - 32.50 ES Very dense dark grey silty SAND with extremely PID 32.20 PID = 1 ppm to closely spaced black sandy silt partings and <10mm pockets. Sand fine and medium. [THANET SAND FORMATION] 90 33 33.10 - 33.25 CS 33.50 - 35.00 33.50 SPT N=50 (25 for 90mm/50 for 70mm) 34.10 - 34.30 CS 94 35.00 - 35.28 CS 35 Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

1. Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pi; with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe. Response zone from 41.10 m to 47.10 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks

		: Meridiar Ground I			n i				-	h of Enfiel			Date: 0	2/07/20	21 - 16/	07/2021	1	
catio	n: Meri	idian Wat	er, Er	nfield		Limit		. Grou	na ie	chnology (	services				548.821			
oject	No. : 0	GTS-19-2	50			Crew	v Nam	e: RF	-CB+F	RF / CB			Drilling 405	Equipm	ent: JCI	B 3CX	Comma	chic
		umber H2089			Type P+RC			evel m AOI	0	100	ged By JF / DV			Scale 1:25		1	age Num heet 8 of	
	Water	San	nple a	nd In	Situ Testing			Coring	j.	Legend	Depth			Stratum	Descript	tion		
_ °	Strikes	Depth ( 35.00 - 36		Type	Results	_	TCR	SCR	RQD		(Level)	Vine	r donce d		00		extremely	+
							97					to c	losely spa mm pock ANET SA	eced blace ets. Sand	k sandy d fine and	silt partir d mediur	ngs and	3
		36.50 - 3: 36.50		CSPT	N=50 (5,18/50 90mm)	t for	27					AZC	L betwee	an 36.87	7 and 38	1.00 m.		3
		38.00 - 39	9.50	С		•	19					AZC	L betwee	en 38.30	and 39	1.50 m.		3
	ole Diamo		0.05		N=50 (4,14/50 145mm)					elling	4					g Flush		4
th Ba 37.10	ise [	Diameter 146	Depth	Base	Diameter	Dept	th Top	Depth	Base	Duration	Too	N	Depth Yop (m)	Depth Sale (m)	Flush Type	Flush Colou	Min (%)	Max
mar			noiting		services 2 Tria							0201						

		: Meridian Ground In		n				-	h of Enfiel			Date: 02/07/2021 - 16/	/07/2021	
ati	on: Mer	idian Wate	r, Enfield		Limit	ed	1001000	ANN CREATE	chnology (	Services	•	Co-ords: E535548.82 Drilling Equipment: JC		nachie
•	Service Control	GTS-19-25	3777		Crev			+CB+F	RF / CB			405		
	ehole N DZ4_B			e Type P+RC		1000	evel m AOI	D		ged By		Scale 1:25	Page Nu Sheet 9	
ell	Water			Situ Testing			Coring	jā	Legend	Depth		Stratum Descrip	vion	T
-	Strikes	Depth (m	) Type	Results		TCR	SCR	RQD	Legena	(Level)				
		41.00 - 42 41.00 41.60 - 41 41.75 - 41 41.75 42.00	SPT	N=50 (3,5/50 140mm) PID = 1 pp	6	100	20	10		40.35 (-19.96)	to cl <10ri [TH/ medii glauci subro m (Bi Very light close with tight smoo [WH putty from DINI fragm	or dense dark grey silty SAI losely spaced black sandy my pockets. Sand fine an ANET SAND FORMATION for and coarse gravel to corite coated black occupunded flints between 4 ullhead Beds). I weak medium density white grey burrowing mottling. ely to medium spaced, cle fine sand and very pale to the coated black occupunded flints. CIR ITE CHALK SUBGROUP or chalk and fragmented 41.00 to 41.20 m. between 41.20 and 41. Interted medium flint at 42.  24mm. between 41.77 and 42.	silt partings and did medium.  If o cobble sized asionally brown to 30 and 40.3 and	5
		42.50 - 44 42.50	.00 C SPT	N=50 (3,8/50 245mm)							distu	between 42.50 and 42. rbed. um flint at 42.92 m.	93 m. SPT	4
		43.36 - 43 43.50 43.50	EW			100	70	62			small	I flint at 43.26 m. I flint at 43.54 m.		4
		44.00	SPT	N=50 (3,7/50 280mm)		94	69	46			DINI chalk NP=1 large 44.82	flints between 44.20 at between 44.30 and 44. c due to SPT. 18mm fragmented flints between 2 m.	55 m. Putty	
	Hole Diam			Diameter					elling				ng Flush	
th	Base	Diameter	Depth Base	Diameter	Dept	th Top	Depth	Base	Duration	Too	k	Depth Yop (m) Depth Seie ImiliFlush Typ	e Flush Colour Min (9	6) Ma
	arks		No.					CD to 2		- 4-10 4		spected obstructions in the ma		

### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 02/07/2021 - 16/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535548.82 N191549.19 Drilling Equipment: JCB 3CX | Commachio Project No.: GTS-19-250 Crew Name: RF+CB+RF / CB Borehole Number Hole Type Logged By Scale Page Number AB / JF / DW GI\_DZ4\_BH2089 CP+RC 12.14m AOD 1:25 Sheet 10 of 10 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) RQD Depth (m) Type Results TOR SCR Very weak medium density white CHALK with light grey burrowing mottling. Fractures are closely to medium spaced, clean and infilled with fine sand and very pale greyish white silt, tight, horizontal to inclined, planar, rough and smooth. Occasional flints. CIRIA Grade B3. [WHITE CHALK SUBGROUP] 45.60 - 47.10 DINI between 45.60 and 46.25 m. Putty 45.60 SPT N=50 (4,7/50 for chalk over SPT interval. 270mm) 46 46.24 - 46.44 CS 100 NP=20mm. medium fragmented flint at 46.77 m. 47 47.10 End of Borehole at 47.10m (-28.21)48 49 50 Hole Diameter Casing Diameter Chiselling **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Min (%) Max (%) Dayth Yop (m) Depth Base (m) Flush Type Flush Col 8.20 47.10 Polymer

### Remarks

 Position CAT scanned - position clear of services. 2. Trial pit excavated with JCB to 3.00 m prior to drilling due to expected obstructions in the made ground. 3. Hole progressed through backfilled trial pit with cable percussive techniques into the top of the London Clay Formation. 4. Environmental seals installed from 1.50 m to 3.50 m, from 7.70 m to 9.70 m and from 22.60 to 24.60 m. 5. Rotary follow on from 9.70 m. 6. Single install with 50 mm pipe.
 Response zone from 41.10 m to 47.10 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.



## **Photographic Report**

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 8.2 - 9.7 2089 9.7 - 11.0





2089 11.0 - 12.6 2089 12.6 - 14.1



## **Photographic Report**

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 14.1 - 15.7 2089 15.7 - 17.2





2089 17.2 - 18.7 2089 18.7 - 20.2



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 20.2 - 21.7 2089 21.7 - 23.1





2089 21.7 - 24.7 2089 23.1 - 24.6



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 24.7 - 26 2089 26 - 27.5





2089 27.5 - 29 2089 29 - 30.5



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





089 30.5 - 32 2089 32 - 33.5





2089 33.5 - 35 2089 35 - 36.5



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 36.5 - 38 2089 38 - 39.5





2089 39.5 - 41 2089 41 - 42.5



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2089

Project ID:

GTS-19-250





2089 42.5 - 44 2089 44 - 45.0





# Trial Pit Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 21/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535503.89 N191630.48 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: NC Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ4\_BH2088B TP 12.09m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 12.09 Firm, brown, slightly sandy, slightly gravelly clay, Gravel is angular to subrounded, fine to medium, flint, quartzite and brick. Sand is fine. 0.20 ES [MADE GROUND] PID PID=0.40 0.20 0.30 В 0.30 ES 0.40 11.69 Blackish grey, fine to coarse, sand and gravel. Gravel PID=0.50 0.30 PID is angular to rounded, fine to coarse, coal ash, brick, 0.50 ES concrete, flint and quartzite. Low cobble content of 0.50 PID PID=3.50 subrounded coal ash. 0.60 В [MADE GROUND] geotextile membrane at 0.40 m. 0.80 ES 0.80 PID PID=3.80 0.90 11.19 Reinforced concrete with rebar. [MADE GROUND] 1 1.40 10.69 Blackish grey, fine to coarse, sand and gravel. Gravel is angular to rounded, fine to coarse, coal ash, brick, 1.50 D 1.50 ES concrete, flint and quartzite. Low cobble content of 1.50 PID PID=4.00 subrounded coal ash. [MADE GROUND] 1.80 B 1.90 10.19 Soft brown mottled light brown, slightly silty clay. Slight organic odour. Rare peaty wood fragments 2 (<40mm). [MADE GROUND] 2.20 D ES 2 20 PID PID=1.40 240 9.69 Blackish grey, very sandy gravel. Gravel is angular to subrounded, fine to coarse, coal ash, brick and flint. 2.50 D Low cobble content of subrounded coal ash. [MADE GROUND] 2.80 2.80 End of Trial Pit at 2.80m 2.80 ES 2.80 PID PID=1.20 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Length (m) Pit Width (m) Orientation (deg) Pit Stability Shoring Used Remarks Rate Remarks 2.50 0.70 Groundwater strike at 2.80 m. Oily. Weather

## Remarks

1. Position excavated due to samples lost in BH2088. 2. Position scanned using a CAT prior to digging. 3. Oily sheen on groundwater. 4. Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088B

Project ID:

GTS-19-250





## 1. Prior to excavation



3. Complete excavation

2. Excavation to top of concrete



4. Base and sides



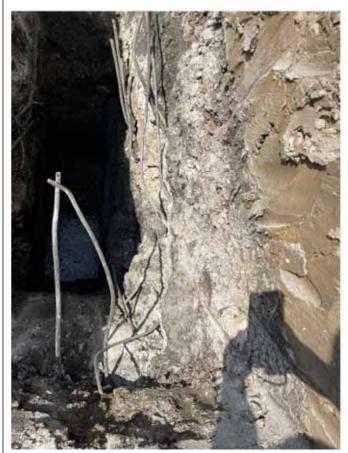
Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088B

Project ID:

GTS-19-250





5. Excavation side

6. Excavation and spoil



#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/06/2021 - 08/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Co-ords: E535503.89 N191630.48 Location: Meridian Water, Enfield Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Borehole Number Page Number Hole Type Level Logged By Scale **GI DZ4 BH2088** CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 1 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Results TOR SCR RQD Type Light brown and white GRAVEL. Gravel is 0.00 - 0.15В rounded to angular medium and coarse flint. 0.15 0.10 - 0.20 ES [MADE GROUND] (12.09)0.10 PID PID = 0 ppm Stiff brown mottled bluish grey slightly sandy 0.15 - 0.50В slightly gravelly CLAY with very few very fine 0.35 0.30 - 0.40 roots. Sand is fine to coarse. Gravel is angular ES (11.94)0.30 PID PID = 1 ppm to rounded fine to coarse flint - Capping layer 0.50 [MADE GROUND] 0.50 - 0.60Dark brown and reddish brown sandy GRAVEL. 0.50 PID PID = 0 ppmSand is fine to coarse, Gravel is angular fine to coarse brick and concrete. 0.80 - 0.90D [MADE GROUND] 0.80 - 1.10(11.74)geotextile membrane at 0.43 m. 0.80 - 1.10 В 12 mm and 25 mm rebar at 0.50 m. 0.90 - 1.00ES PID = 1 ppm Dark brown to black slightly gravelly SAND. 0.90 PID 1.00 - 1.10 Sand is fine to coarse, Gravel is subangular (11.29)fine to coarse brick and concrete. Hydrocarbon [MADE GROUND] Strong CONCRETE, 30-40% aggregate of subangular medium and coarse flint. Up to 5% 1.60 В small voids 1.60 - 1.70 D (10.99)[MADE GROUND] 1.60 - 2.60 В Soft light brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is 1.90 - 2.00 ES subrounded fine to coarse flint. Hydrocarbon 1.90 PID PID = 0 ppm [MADE GROUND] 2.60 Medium dense black sandy GRAVEL. Sand is (10.49)fine to coarse. Gravel is subangular to subrounded fine to coarse flint. Strong hydrocarbon odour. 2.90 - 3.00[MADE GROUND] 2.90 PID PID = 2 ppm3.00 - 3.45 3.00 - 3.50 D B 3.00 SPT N=13 (1,0/2,3,4,4) 3.30 - 3.40ES 3.50 PID PID = 111 ppm 3.60 - 4.10 UT 3.60 Stiff brownish grey slightly gravelly slightly 3.60 - 4.20 (9.49)sandy silty CLAY. Sand is fine and medium. Gravel is fine and medium flint. Slight hydrocarbon odour [MADE GROUND] 4 4.20 - 4.304.20 ES Soft dark grey to black mottled brownish grey 4.20 PID PID = 330 ppm (8.49)CLAY. Strong hydrocarbon odour. 4.30 - 4.60 В [ALLUVIUM] 4.60 - 4.70 ES 4.60 Medium dense multi coloured slightly sandy 4.60 - 5.60 B (7.89)GRAVEL. Sand is fine and medium. Gravel is SPT 4.60 N=13 (2.2/3,4,3,3) subrounded to subangular fine to coarse flint. 4.60 PID PID = 649 ppm Strong hydrocarbon odour and oily sheen. 4.90 - 5.00 ES [KEMPTON PARK GRAVEL FORMATION] 4.90 PID = 259 ppm PID 5 Hole Diameter Casing Diameter Chisel Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (in) Depth Base (in) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. concrete obstruction found - obstructions removed to 2.60 using JCB.
Hole backfilled with arisings. 3. Hole commenced using cabe percussive techniques into 1the top of the London Clay Formation. 3. Environmental seals installed from 1.00 m
to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.5. Rotary follow on from 9.15 m.6. Single install with 50 mm pipe. Response zone from 40.50 m to 45.60 m.7.
Hole grouted above response zone to 0.30 m and grout left to oure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Borehole Number Hole Type Logged By Page Number Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB/JF/ND 1:25 Sheet 2 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD Medium dense multi coloured slightly sandy GRAVEL. Sand is fine and medium. Gravel is subrounded to subangular fine to coarse flint. Strong hydrocarbon odour and oily sheen. [KEMPTON PARK GRAVEL FORMATION] 5.60 - 6.60 5.60 CSPT N=12 (2,2/3,3,3,3) 5.90 - 6.00 5.90 PID PID = 191 ppm 6 6.60 - 6.70 D 6.60 - 7.60 6.60 CSPT N=12 (1,2/2,3,3,4) 6.90 - 7.00 ES PID = 14 ppm 6.90 PID 7.00 - 7.50 100 7.50 EW 7.50 - 9.30 7.60 - 7.70 7.60 - 8.00 CD B CSPT 7.60 N=11 (1,2/2,2,3,4) 7.90 - 8.007.90 PID PID = 2 ppm 8.00 Dark grey silty laminated CLAY, Laminations 8.00 - 8.10 D (7.49)are very closely spaced and thin slit. Frequent pyritic nodules throughout (up to 21 mm). [LONDON CLAY FORMATION] 8.00 - 9.00 В 8.30 - 8.40 8.30 PID PID = 1 ppm 28 8.60 - 9.15 9.00 - 9.10 9 9.00 - 9.15 9.30 - 10.50 N=23 (6,4/5,5,6,7) 96 10 Hole Diameter Casing Diameter Chisell Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seise (m) Flush Type Flush Colour Min (%) Max (%) 250 8.00

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 concrete obstruction found - obstructions removed to 2.60 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into 15th top of the London Clay Formation.
 Environmental seals installed from 1.00 m to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.
 Response zone from 40.50 m to 45.60 m.
 Hole grounded above response zone to 0.30 m and grout left to our electron installing headworks.

Location: Meridian Water, Enfield					ondon Bo	rough of Enfie	Date: 16/06/2021 - 08/07/2021					
					or: Grour	nd Technology		Co-ords: E535503.89 N191630.48				
					me: NC /	CB+NC+CB			Drilling Equipment: Hand Tools   Dando 20   Commachio 405   JCB 3CX			
Borehole Number Hole Type					Level Logged By				Scale	Pa	ge Numb	
GI_DZ4_	1		P+RC	12.0	9m AOD	AB	/JF/ND	Ę Į,	1:25	Sh	eet 3 of	10
ell Water Strike		mple and In Situ Testing (m) Type Results		Coring  TCR SCR RQD		Legend RQD	Depth (Level)		Stratum Description			
	Depth (m)	0 C	N=16 (1,3/2,4,4		SCR	X		are v	grey silty laminated CLAY very closely spaced and the ic nodules throughout (up NDON CLAY FORMATION	in slit. Fre to 21 mm	equent	11
	12.40 - 14.0 12.40		N=22 (2,4/4,6,0	100								1:
	14.00 - 15.3 14.00		N=30 (3,4/6,7,8,9)		spaced slightly sandy beds from 15.02 m.  with rare black lignite fragments to 15.02 m.				rom 14.0 ents from	14.00 to from 14.37		
Hole Dia						X		(<10 i fissur clean with g 14.99	very closely spaced stiff clay pockets mm) between 16.64 and 15.02 m. res 80 degrees, planar smooth tight between 14.86 and 15.02 m. green glauconitic sand laminae between 9 and 15.02 m.  Drilling Flush			
pth Base	Diameter D	epth Base	Diameter	Depth Top	Depth B	ase Duration	Tool		Depth Yop (m) Depth Base (m) Flush Type	Flush Colour	Min (%)	Max

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/06/2021 - 08/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Borehole Number Hole Type Logged By Page Number Level Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 4 of 10 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Dark grey silty laminated CLAY, Laminations (4.09)are very closely spaced and thin slit. Frequent pyritic nodules throughout (up to 21 mm). LONDON CLAY FORMATION] SPT 15.30 N=50 (B, 13/50 for Very dense dark greyish brown clayey SAND 130mm) with very closely spaced stiff clay <10mm pockets and occasional white foraminifera. Sand fine and medium slightly glauconitic. 15.60 - 16.90 C (SWANSCOMBE) [HARWICH FORMATION - SWANSCOMBE MEMBER] very thinly interbedded with clay and sandy 15.90 clay from 15.30 to 15.60 m. (-2.93)Stiff fissured blueish grey mottled orangish 16.10 - 16.30 brown CLAY. Fissures 0-90 degrees extremely 16.10 PID PID = 0 ppm to closely spaced planar to undulating polished 100 16.30 - 18.50 LAMBETH GROUP - UPPER MOTTLED 16.32 - 16.55 CLAY] with occasional rounded medium to coarse white flint gravel from 15.90 to 15.15 m. occasionally mottled orangish and reddish prown between 16.30 and 16.70 m. Shear dipping at 45 degrees planar striated 16.90 between 16.73 and 16.74 m. N=27 (1,3/5,6,7,9) 17 grey occasionally mottled orangish and reddish brown between 17.15 and 18.60 m. 73 17.49 - 17.73 CS 18 18.50 - 20.00 18.50 SPT N=40 Very stff blueish grey mottled reddish brown to (3,5/8,8,11,13) purple and occasionally orangish brown slightly sandy CLAY. Sand is fine and medium. [LAMBETH GROUP - UPPER MOTTLED CLAYI 19 19.05 - 19.31 100 fissured mottled orangish and occasionally reddish brown from 19.28 to 19.62 m. Fissures 0-90 degree planar to undulating polished very tight clean. light blueish grey and white calcareous from 19.62 to 19.70 m. 19.70 Extremely weak white occasionally blueish grey (-6.51)CALCRETE with closely spaced stiff clay bands [LAMBETH GROUP - MID LAMBETH HIATUS] 20 **Drilling Flush** Hole Diameter Casing Diameter Chisel Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool epth Seie In Flush Type Flush Colour Min (%) Max (%)

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 concrete obstruction found - obstructions removed to 2.60 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into 15th top of the London Clay Formation.
 Environmental seals installed from 1.00 m to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.
 Response zone from 40.50 m to 45.60 m.
 Hole grounded above response zone to 0.30 m and grout left to our electron installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Page Number Borehole Number Hole Type Logged By Scale Level GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 5 of 10 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) TOR SCR RQD Type Results 20.00 SPT N=50 (6,19/50 for Extremely weak white occasionally blueish grey 120mm) CALCRETE with closely spaced stiff clay bands [LAMBETH GROUP - MID LAMBETH HIATUS] light blueish grey mottled orange and white calcareous clay from 20.10 to 20.36 m. 20.50 - 21.50 medium strong between 20.36 and 20.48 m. (-7.61)20.58 - 20.83 CS Very stff greenish grey mottled orange sandy CLAY. Sand is fine and medium. [LAMBETH GROUP - LOWER MOTTLED 90 mottled orange and brown very sandy from 21 20.95 to 21.35 m. 21.35 Dark greenish grey silty glauconitic SAND with (-8.39)very closely spaced burrows infilled (<10 mm) 21.50 - 22.90 with firm brown sandy clay. Sand is fine and [LAMBETH GROUP - LOWER MOTTLED CLAY] 22 32 22.75 [LAMBETH GROUP - LOWER MOTTLED (-9.26)CLAY 22.90 - 24.50 AZCL between 22.75 and 23.65 m. SPT 22.90 N=50 (6,1/50 for 23 105mm) 56 Light yellowish brown clayey very gravelly SAND. Sand is fine and medium, Gravel is (-10.66)23.82 angular to rounded fine to coarse flint. (-11.56)[LAMBETH GROUP - LOWER MOTTLED 24.00 - 24.20 ES Very dense dark brownish grey silty SAND with 24.00 PID = 0 ppmextremely to very closely spaced burrows infilled (<10 mm) with stiff dark grey clay. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] stiff sandy clay lamina between 23.98 and 24.50 - 25.90 23.99 m. 24.50 N=50 (15,10/50 light grey sand burrow infill from 24.50 to for 220mm) 23.82 m. EW 25.00 25 Hole Diameter Casing Diameter Chisel Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Yee (in) Depth Said (in) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. concrete obstruction found - obstructions removed to 2.60 using JCB.
Hole backfilled with arisings. 3. Hole commenced using cabe percussive techniques into 1the top of the London Clay Formation. 3. Environmental seals installed from 1.00 m
to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.5. Rotary follow on from 9.15 m.6. Single install with 50 mm pipe. Response zone from 40.50 m to 45.60 m.7.
Hole grouted above response zone to 0.30 m and grout left to oure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Hole Type Borehole Number Level Logged By Page Number Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 6 of 10 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type 25.00 Very dense dark brownish grey silty SAND with extremely to very closely spaced burrows infilled (<10 mm) with stiff dark grey clay. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] black lignite fragment at 25.27 m. 100 frequent white shell fragments between 25.90 - 27.40 25.79 and 25.82 m. 25.95 25.90 SPT N=50 (4,8/50 for occasional white shell fragments between 26 240mm) 25.82 and 26.67 m. Very stff thinly to thickly laminated dark brownish grey CLAY with silty sand laminae. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 26.45 Dark brownish grey silty SAND with extremely (-13.86)to very closely spaced burrows infilled (<10 100 mm) with stiff dark grey clay and grey sand. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] frequent white shell fragments between 26.67 and 26.71 m. 26.98 27 Very stff thinly to thickly laminated dark brownish grey CLAY with silty sand laminae. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] interlaminated between 27.20 and 27.80 m. 27.40 - 28.70 SPT N=50 (4,7/50 for 27.40 265mm) interlaminated between 27.92 and 28.51 m. 100 28.70 - 30.50 [LAMBETH GROUP - UPNOR FORMATION] 28.70 SPT N=50 (5,8/50 for AZCL between 28.70 and 29.40 m. 230mm) 29 Dark brownish grey silty SAND with extremely 56 29.40 to very closely spaced burrows infilled (<10 (-16.61)mm) with stiff dark grey clay and grey sand. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] gravelly from 29.65 to 98.84 m. Gravel is rounded fine to coarse flint. gravelly from 29.92 to 30.12 m. Gravel is rounded fine and medium flint 30.00 EW 30 Hole Diameter Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Yee (in) Depth Said (in) Flush Type Flush Colour Min (%) Max (%)

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 concrete obstruction found - obstructions removed to 2.60 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into 15th top of the London Clay Formation.
 Environmental seals installed from 1.00 m to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.
 Response zone from 40.50 m to 45.60 m.
 Hole grounded above response zone to 0.30 m and grout left to our electron installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Borehole Number Hole Type Logged By Page Number Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 7 of 10 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) RQD Depth (m) Results TOR SCR Type 30.00 Dark brownish grey silty SAND with extremely to very closely spaced burrows infilled (<10 mm) with stiff dark grey clay and grey sand. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] sandy gravel bed between 30.30 and 30.40 30.50 - 32.00 m. Gravel rounded fine to coarse. SPT N=50 (4,13/50 for 30.50 Very dense dark grey silty SAND with extremely 110mm) to closely spaced black sandy silt partings and 30.60 - 30.80 ES <10mm pockets. Sand fine and medium. 30,60 PID PID = 0 ppm [THANET SAND FORMATION] 31 100 32.00 EW 32 32.00 - 33.50 C 32.00 N=50 (25 for 135mm/50 for 100mm) 100 33 33.50 - 35.00 33.50 SPT N=50 (4,10/50 for 34 100 black sandy silt lamina (2 mm) at 34.46 m. 35.00 - 36.50 C 35 Drilling Flush Casing Diameter Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%) Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. concrete obstruction found - obstructions removed to 2.60 using JCB. Hole backfilled with arisings. Hole commenced using cabe percussive techniques into 15th top of the London Clay Formation. Environmental seals installed from 1.00 m to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n. Response zone from 40.50 m to 45.60 m. Hole grounded above response zone to 0.30 m and grout left to our electron installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Page Number Borehole Number Hole Type Level Logged By Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 8 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD 35.00 N=50 (25 for Very dense dark grey silty SAND with extremely 140mm/50 for to closely spaced black sandy silt partings and <10mm pockets. Sand fine and medium. 130mm) [THANET SAND FORMATION] with white shell fragments between 35.62 100 and 35.64 m. 36 with white shell fragments between 36.28 and 36.30 m. with rare black lignite fragments between 36.50 - 38.00 36.50 SPT N=50 (6,14/50 for 36.46 and 37.22 m. 135mm) 37 sandy gravel from 37.13 to 37.22 m. Gravel 100 angular to subrounded medium and coarse (-18.31)37.32 - 37.52 ES flint. (Bullhead Beds) PID 37.32 PID = 0 ppm Very weak medium density white CHALK with light grey mottling. Fractures 0-80 degrees very 37.52 - 37.72 CS closely to medium spaced (30/170/310) planar smooth to rough tight with probable flush coating. CIRIA Grade B3 [WHITE CHALK SUBGROUP] 38 00 - 39 60 SPT N=50 (5,19/50 for 38.00 150mm) 100 black sponge bed between 38.96 and 38.98 39.12 - 39.32 CS NP=21mm. 39.60 - 41.10 C DINI between 39.62 and 39.86 m. SPT 39.60 N=53 (25 for 45mm/50 for fragmented nodular large flint at 39.72 m. 155mm) 40 Hole Diameter Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Depth Top (m) Depth Seie (m) Flush Type Flush Colour Min (%) Max (%)

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. concrete obstruction found - obstructions removed to 2.60 using JCB.
Hole backfilled with arisings. 3. Hole commenced using cabe percussive techniques into 1the top of the London Clay Formation. 3. Environmental seals installed from 1.00 m
to 3.00 m, from 7.15 m to 9.15 m and from 19.50 to 21.50 n.5. Rotary follow on from 9.15 m.6. Single install with 50 mm pipe. Response zone from 40.50 m to 45.60 m.7.
Hole grouted above response zone to 0.30 m and grout left to oure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 16/06/2021 - 08/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535503.89 N191630.48 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: NC / CB+NC+CB Commachio 405 | JCB 3CX Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ4\_BH2088 CP+RC 12.09m AOD AB / JF / ND 1:25 Sheet 9 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) RQD Depth (m) Type Results TOR SCR Very weak medium density white CHALK with light grey mottling. Fractures 0-80 degrees very closely to medium spaced (30/170/310) planar smooth to rough tight with probable flush coating. CIRIA Grade B3 [WHITE CHALK SUBGROUP] 40.42 NP=20mm. (-25.13)100 abundant <20mm platyceramus shell fragments between 40.10 and 40.30 m. Extremely weak to very weak from 40.10 to NP=27mm. 40.91 - 41.04 CS DINI between 40.32 and 40.42 m. Very weak medium density white CHALK with 41.10 - 42.60 light grey mottling. Fractures 0-80 degrees very 41.10 SPT N=41 closely to medium spaced (80/290/740) planar (6,5/6 10,12,13) smooth to rough tight clean locally with probable flush coating. CIRIA Grade A2 [WHITE CHALK SUBGROUP] FINI between 40.57 and 40.73 m. nodular large flint at 40.63. NP=18mm. DINI between 41.04 and 41.10 m. 41.80 - 41.92 cs 100 100 100 DINI between 41.10 and 41.66 m. SPT disturbed. very small flints between 41.71 and 41.78 m. NP=19mm. small finger flints between 42.09 and 49.27 42.50 EW NP=16mm. 42.60 - 44.10 C fragmented small flint at 42.60 m. DINI between 42.60 and 43.06. SPT SPT 42.60 N=41 (2.5/7.9.12.13)disturbed. 43 NP=16mm 100 100 95 small flint at 43.65 m. FINI between 43.65 and 43.69 m. DINI between 43.79 and 43.83 m. 44 NP=15mm. 44.10 - 45.60 DINI between 44.10 and 44.43 m. SPT SPT N=50 (4,8/50 for 44.10 disturbed. 255mm) NP=16mm. 100 100 100 small flint at 44.61 m. fragmented medium flint at 44.85 m. 45 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Yop (int) Depth Seie (int) Flush Type Flush Colour Min (%) Max (%) Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. concrete obstruction found - obstructions removed to 2.60 using JCB. Hole backfilled with arisings. Hole commenced using cabe percussive techniques into 1th top of the London Clay Formation. Environmental seals installed from 1.00 m to 3.00 m, from 7.15 m to 9.15 m to 9



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 9.40 - 10.90 2088 10.90 - 12.40





2088 12.40 - 14.00 2088 14.00 - 15.30



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 14:00 - 15:60 2088 15:60 - 16:90





2088 16:90 - 18:50 2088 18:50 - 20:00



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 20.00 - 21.50 2088 21.50 - 22.90





2088 22.90 - 24.50 2088 24.50 - 25.90



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 25.90 - 27.40 2088 27.40 - 28.70





2088 28.70 - 30.50 2088 30.50 - 32.00



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 32.00 - 33.50

2088 33.50 - 35.00 photo board depth mistabelled 36.50 - 38.00





2088 35.00 - 36.50 2088 36.50 - 38.00



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ4\_BH2088

Project ID:

GTS-19-250





2088 38.00 - 39.60 2088 41.1 - 42.60





2088 42.6 - 44.1 2088 44.1 - 45.6

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 07/07/2021 - 12/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535662.24 N191572.48 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: JCB 3CX | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number AB / JF 1:25 GI\_DZ4\_BH2083 CP 12.69m AOD Sheet 1 of 2 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 0.05 12.69 Light brownish grey GRAVEL. Gravel angular to well rounded medium and coarse flint. [MADE GROUND] Firm brown CLAY 0.30 12.64 [MADE GROUND] Dark greyish brown to black sandy very clayey GRAVEL with medium cobble and boulder content with 0.50 ES 0.50 - 0.60 0.50 - 0.60 black hydrocarbon staining and odour and occasional В timber plastic and metal fragments. D [MADE GROUND] 0.50 PID PID = 0 ppm geotextile membrane at 0.30 m. slightly clayey from 0.70 to 1.50 m. 1.50 ES clayey from 1.50 to 2.70 m. 1.50 - 1.60 1.50 - 1.60 В D 1.50 PID PID = 51 ppm 2 2.50 ES 2.50 - 2.60 2.50 - 2.60 В D 12.39 2.70 PID PID = 10 ppm 2.50 Reinforced CONCRETE. [MADE GROUND] 9.99 2.85 Firm dark grey to black slightly sandy slightly gravelly CLAY with black hydrocarbon staining and odour. Sand fine to coarse. Gravel angular to rounded fine to 3.10 ES coarse flint. 3.10 - 3.20 В [ALLUVIUM] 3.10 - 3.20 D 3.10 PID PID = 85 ppm 4.10 ES PID 4.10 PID = 656 ppm 4.20 - 4.70 В 4.20 N=7 (1,1/1,2,2,2) 4.80 D 4.90 D 5 Inclination and Orientation Hole Diameter Casing Diameter Chisel Depth Base Depth Base Diameter Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

#### Remarks

Position CAT scanned - position clear of services, inspection pit terminated due to obstructions 2. Hole excavated through made ground to 3.60 m by JCB to clear concrete
obstructions and backfilled 3. Hole completed using cable percussive techniques through the backfilled trial pit into the top of the London Clay Formation. 4. Environmental
seal installed from 3.70m to 4.70 m. Additional seal installed from 8.00 m to 9.65 m to protect contamination migration whilst borehole standing over the weekend. Seal drilled
aut after the weekend. 5. Single install with 50 mm pipe. Response zone from 5.00 m to 8.70 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 07/07/2021 - 12/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535662.24 N191572.48 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: JCB 3CX | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 1:25 GI\_DZ4\_BH2083 CP 12.69m AOD AB/JF Sheet 2 of 2 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Firm dark grey to black slightly sandy slightly gravelly 5.10 ES CLAY with black hydrocarbon staining and odour. 5.10 PID PID = 1638 ppm Sand fine to coarse. Gravel angular to rounded fine to 5.20 - 5.65 UT coarse flint. [ALLUVIUM] 5.90 D 6.00 9.84 Medium dense dark grey sandy GRAVEL . Sand is 6.10 medium and coarse. Gravel is angular to rounded fine 6.10 PID PID = 2130 ppm to coarse multicoloured flint. Hydrocarbon odour and 6.20 - 6.70 6.20 CSPT N=12 (2,3/2,3,3,4) [KEMPTON PARK GRAVEL FORMATION] 6.50 EW 6.50 EW 6.50 7.00 D 7.00 EW 7.00 EW 7.20 - 7.70 B 7.20 N=22 (1,3/3,4,7,8) 8.00 D 8.20 - 8.70 8.20 **cSPT** N=21 (2,3/3,4,7,7) 8.70 - 9.00 D 8.70 6.69 Very stiff thinly laminated brownish grey slightly sandy [LONDON CLAY FORMATION] 9 9.10 ES PID = 2008 ppm

Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

3.99

End of Borehole at 9.65m

10

9.10

9.20

PID

N=28 (3,3/6,6,7,9)

Position CAT scanned - position clear of services, inspection pit terminated due to obstructions 2. Hole excavated through made ground to 3.60 m by JCB to clear concrete
obstructions and backfilled; 3. Hole completed using cable percussive techniques through the backfilled trial pit into the top of the London Clay Formation. 4. Environmental
seal installed from 3.70m to 4.70 m. Additional seal installed from 8.00 m to 9.65 m to protect contamination migration whilst borehole standing over the weekend. Seal drilled
out after the weekend.

9.65

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 14/07/2021 - 15/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535532.64 N191579.85 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Scale Page Number Logged By CP GI DZ4 BH2082 12.21m AOD AB / AM 1:25 Sheet 1 of 3 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Results Type Dark brown silty fine SAND. [MADE GROUND] 0.20 ES 0.20 - 0.30 0.20 - 0.30 BD 0.30 12.21 Stiff brown CLAY [MADE GROUND] 0.20 PID PID = 0 ppm0.40 ES 0.50 11.91 Mass CONCRETE 0.40 - 0.50 0.40 - 0.50 В [MADE GROUND] D 0.65 11.71 Brown to black sandy clayey GRAVEL with medium 0.40 PID PID = 0 ppmcobble and boulder content plastic metal and timber fragments and black hydrocarbon staining and odour. Sand fine to coarse. Gravel angular to rounded fine to coarse clinker brick and concrete. Cobbles and 1.00 ES 1.00 - 1.10 1.00 - 1.10 boulders angular concrete and brick. В [MADE GROUND] D 1.00 PID PID = 16 ppm 1.60 11.56 Dark brown COBBLES with many boulders and some sandy gravel. Cobbles and boulders angular brick and concrete. Sand fine to coarse. Gravel angular clinker brick and concrete. IMADE GROUNDI 2.00 10.61 Brown to black sandy clayey GRAVEL with medium cobble and boulder content plastic metal and timber fragments and black hydrocarbon staining and odour. Sand fine to coarse. Gravel angular to rounded fine to coarse clinker brick and concrete. Cobbles and boulders angular concrete and brick. [MADE GROUND] 2.50 ES 2.50 10.21 Dark brown COBBLES with many boulders and some 2.50 - 2.60 2.50 - 2.60 В sandy gravel. Cobbles and boulders angular brick and D concrete. Sand fine to coarse. Gravel angular clinker PID 2.50 PID = 32 ppm brick and concrete. [MADE GROUND] 2.90 9.71 Firm dark grey to black CLAY with black hydrocarbon 3 staining and odour and sandy gravel <100mm lenses with liquid hydrocarbon. Sand fine to coarse. Gravel 3.10 ES 3.10 9.31 angular to rounded fine to coarse flint. 3.10 - 3.20 В [MADE GROUND] 3.10 - 3.20 D Soft blackish grey, slightly peaty, slightly sandy, slightly 3.10 - 3.50В gravelly clay. Gravel is angular to subrounded, fine to 3.10 PID PID = 130 ppm medium, brick, fabric, flint, metal. Sand is fine to ES coarse. Strong hydrocarbon odour and oily. 3,50 PID PID = 108 ppm [MADE GROUND] 3.70 - 4.15 UT 3.70 9.11 Firm to stiff, fissured, grey mottled brownish grey occasionally mottled dark grey CLAY. Fissures are randomly orientated, planar smooth. Likely reworked presence of anthropogenic material in underlying beds [ALLUVIUM - REWORKED] 4.15 - 4.30 D 4.50 ES 4.50 PID PID = 2 ppm

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Base Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

3.50 250 3.50 250

5

#### Remarks

4.60

4.70 - 5.20

4.70

D

В

SPT

N=9 (1,1/2,2,2,3)

 Position CAT scanned - position clear of services.
 Concrete in attempted inspection pit excavated by JCB. Made Ground excavated and backfilled to 3.10 m.
 Hole progressed using cable percussive techniques through the backfill and into the top of the London Clay Formation.
 Environmental seal installed from 2.90 m to 3.90 m.
 Single install with 50 mm pipe. Response zone from 5.70 m to 9.20 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 14/07/2021 - 15/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535532.64 N191579.85 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ4\_BH2082 CP 12.21m AOD AB / AM 1:25 Sheet 2 of 3 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Firm to stiff, fissured, grey mottled brownish grey occasionally mottled dark grey CLAY. Fissures are randomly orientated, planar smooth. Likely reworked -5.25 - 5.35 D 5.25 8.51 presence of anthropogenic material in underlying beds. 5.35 - 5.70 В [ALLUVIUM - REWORKED] Soft dark grey, silty, peaty CLAY. Frequent fibrous 5.55 ES wood fragments (<40mm) and rootlets. Likely 5.55 PID PID = 4 ppmreworked - presence of anthropogenic material in 5.70 - 6.15 UT underlying beds. [ALLUVIUM - REWORKED] 5.90 6.96 Medium dense multicoloured sandy GRAVEL. Gravel is fine to coarse, brick, flint and quartzite. Sand is fine to coarse. Hydrocarbon odour. Likely reworked owing to anthropogenic inclusions to 8.50 m. [KEMPTON PARK GRAVEL FORMATION -6.20 - 6.50 D REWORKED] 6.50 ES 6.50 EW 6.50 - 7.00 6.50 **cSPT** N=21 (2,3/3,5,7,6) 6.50 PID PID = 3 ppm 7.00 EW 7.00 EW 7.25 D 7.50 EW 7.50 - 8.00 R CSPT 7.50 N=26 (2,3/5,5,8,8) 8.25 D 8.50 - 9.00 driller notes anthropogenic material absent from 8,50 cSPT N=14 (2,3/4,5,3,2) 8.50 m - possible natural ground. 9 9.30 - 9.50 D 9.30 6.31

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

Stiff, fissured, dark grey, slightly sandy CLAY. Sand is fine. Fissures are randomly orientated, undulating, rough. Occasional gypsum crystals (<1mm).

10

Occasional light grey fine sand / silt partings

[LONDON CLAY FORMATION]

#### Remarks

9.55

9.55

9.60 - 10.05

ES

PID

UT

PID = 11 ppm

 Position CAT scanned - position clear of services.
 Concrete in attempted inspection pit excavated by JCB. Made Ground excavated and backfilled to 3.10 m.
 Hole progressed using cable percussive techniques through the backfill and into the top of the London Clay Formation.
 Environmental seal installed from 2.90 m to 3.90 m.
 Single install with 50 mm pipe. Response zone from 5.70 m to 9.20 m.

## Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/07/2021 - 15/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535532.64 N191579.85 Limited Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number AB / AM GI\_DZ4\_BH2082 CP 12.21m AOD 1:25 Sheet 3 of 3 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Stiff, fissured, dark grey, slightly sandy CLAY. Sand is fine. Fissures are randomly orientated, undulating, rough. Occasional gypsum crystals (<1mm). Occasional light grey fine sand / silt partings. 10.30 D 10.30 2.91 [LONDON CLAY FORMATION] End of Borehole at 10.30m 12 13 14 15 Hole Diameter Chiselling Inclination and Orientation Casing Diameter Depth Base Depth Top Depth Base Duration Diameter Depth Base Diameter Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned - position clear of services, 2. Concrete in attempted inspection pit excavated by JCB, Made Ground excavated and backfilled to

3.10 m. 3. Hole progressed using cable percussive techniques through the backfill and into the top of the London Clay Formation. 4. Environmental seal installed from 2.90 m to 3.90 m. 5. Single install with 50 mm pipe. Response zone from 5.70 m to 9.20 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 29/07/2021 - 02/08/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535589.36 N191656.94 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: JCB 3CX | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ4\_BH2081A CP 11.52m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Level Stratum Description Well Legend Strikes (m) (m) Depth (m) Type Results Firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint quartz and brick. [MADE GROUND] 0.40 11.52 Firm to stiff greyish brown sandy gravelly CLAY with high cobble and medium boulder content and occasional metal plastic and wood fragments. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint brick concrete and clinker. Cobbles are angular and subangular brick and concrete. Boulder subangular concrete. [MADE GROUND] geotextile membrane at 0.40 m. 1.70 11.12 Dark grey to black fine to coarse SAND and GRAVEL with frequent white putty <100mm pockets and strong hydrocarbon cdour. Sand fine to coarse. Gravel angular to rounded fine to coarse flint quartz brick and clinker. Frequent pockets of white putty material, possible ash deposit (<100mm). Strong hydrocarbon odour. [MADE GROUND] 3.00 - 4.00 3.00 - 4.00 ES 3,00 PID PID = 16 ppm 3.20 9.82 3.20 - 3.65UT Firm black silty CLAY hydrocarbon stained and odour. [ALLUVIUM] Stiff grey mottled brown slightly organic clay with extremely closely spaced orangish brown silt partings and black hydrocarbon staining between 3.65 - 3.75 D 3.40 and 4.20 m. 3.80 - 4.00 D 4.00 - 5.004 4.00 - 5.00 ES 4.00 PID PID = 1 ppm 4.20 8.32 4.20 - 4.65 D Firm dark brown to black clayey amorphous PEAT with 4.20 SPT N=17 (2,3/3,4,5,5) hydrocarbon cdour. [ALLUVIUM] 4 80 - 5 00 D 5.00 - 6.00 B 5.00 7.32 5 Inclination and Orientation Hole Diameter Casing Diameter Chise Depth Base Depth Base Diameter Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 4.00

Position redrilled adjacent to BH2081 after early termination. 2. Sampling commenced from the base of the trial pit samped in BH2081. 3. Hole completed using cable percussive techniques into the top of the London Clay Formation. 4. Environmental seal installed from 3.50 m to 5.50 m, 5. Single install with 50 mm pipe. Response zone from 5.00 m to 7.00 m. 6. UXO clearance undertaken by a specialist. 7. ES samples from 3.00 - 4.00 m, 4.00 - 5.00 m and 5.00 - 6.00 m taken at a later date from Bulk samples after original samples were lost.



# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 - 02/08/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535589.36 N191656.94 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: JCB 3CX | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ4\_BH2081A CP 11.52m AOD AM 1:25 Sheet 2 of 2 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 5.00 - 6.00 Medium dense dark grey slightly sandy GRAVEL with 5.00 PID PID = 1 ppm hydrocarbon odour. Sand fine to coarse, Gravel angular to rounded fine to coarse flint occasional 5 20 CSPT N=25 (4,4/7,6,6,6) 5.30 ES [KEMPTON PARK GRAVEL FORMATION] 5.30 PID PID = 0 ppm 5.40 EW 5.50 FW 5.80 EW 5.80 EW 5.80 - 6.00 D 6 6.00 - 7.00brownish grey sandy from 6.00 to 7.00 m. 6.20 cSPT N=21 (4,5/5,4,6,6) 6.80 - 7.00 D 7.00 - 8.00 В 7.00 6.52 Stiff dark greysh brown slightly sandy CLAY with light to dark grey silty sand impersistent partings occasional white forams rare black lignite fragments and 7.20 - 7.65 D hydrocarbon odour. 7.20 SPT N=25 (5,6/5,6,6,8) 7.30 [LONDON CLAY FORMATION] ES PID PID = 0 ppm 7.80 - 8.00D 8.00 - 8.45 UT 8.45 - 8.55 D 8.55 4.52 End of Borehole at 8.55m 9 10 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

### Remarks

Position redrilled adjacent to BH2081 after early termination. 2. Sampling commenced from the base of the trial pit samped in BH2081. 3. Hole completed using cable percussive techniques into the top of the London Clay Formation. 4. Environmental seal installed from 3.50 m to 5.50 m, 5. Single install with 50 mm pipe. Response zone from 5.00 m to 7.00 m. 6. UXO clearance undertaken by a specialist. 7. ES samples from 3.00 - 4.00 m, 4.00 - 5.00 m and 5.00 - 6.00 m taken at a later date from Bulk samples after original samples were lost.

# Water Well Strikes

# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 27/07/2021 - 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535590.28 N191655.13 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ4\_BH2081 CP 11.43m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Depth Stratum Description Legend (m) (m) Depth (m) Type Results Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded, fine to medium, flint, quartzite and brick. 0.20 D [MADE GROUND] 0.20 ES 0.20 PID PID = 0 ppm 0.40 11.43 Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse flint, quartzite, brick, concrete, metal, plastic, coal ash, wood and rebar. High cobble content of 0.70 B subangular to subrounded brick and concrete. 0.70 ES Medium boulder content of subrounded concrete. 0.70 PID PID = 2 ppm [MADE GROUND] geotextile membrane at 0.40 m. 1.40 D 1.70 11.03 Dark grey to black fine to coarse SAND and GRAVEL with frequent white putty <100mm pockets and strong hydrocarbon cdour. Sand fine to coarse. Gravel angular to rounded fine to coarse flint quartz brick and 2.00 В clinker. Frequent pockets of white putty material, 2.00 ES possible ash deposit (<100mm). Strong hydrocarbon 2.00 PID PID = 20 ppm odour. [MADE GROUND] 3.00 3.00 ES 3.00 - 4.00В 3.20 9.73 3.00 SPT N=23 (2,3/4,6,6,7) Firm black silty CLAY hydrocarbon stained and odour. 3.00 PID PID = 6 ppm [ALLUVIUM] 3.50 3.50 - 3.953.50 PID PID = 11 ppm 3.80 - 4.00 D 3.85 - 3.95 D 4.00 - 5.00 4.20 8.23 Firm dark brown to black clayey amorphous PEAT with hydrocarbon cdour. [ALLUVIUM] 4.50 N=24 (3,4/5,5,6,8)

Inclination and Orientation Hole Diameter Casing Diameter Chise Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 3.50

5

7.23

5.00 - 6.00

B

1. Position CAT scanned, and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Trial pit excavated to 3.00 m with JCB to clear location of obstructions, 3. Hole terminated at 7.00 m - hole could not be progressed further after chiselling. 4. Environmental seal installed from 2.50 m to 4.50 m, 5. Hole relocated to BH2081A, 6. UXO clearance undertaken by a specialist.

5.00

## Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 27/07/2021 - 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535590.28 N191655.13 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number 1:25 GI\_DZ4\_BH2081 CP 11.43m AOD AM Sheet 2 of 2 Sample and In Situ Testing Water Depth Legend Well Stratum Description Strikes (m) (m) Depth (m) Type Results Medium dense dark grey slightly sandy GRAVEL with hydrocarbon cdour. Sand fine to coarse, Gravel angular to rounded fine to coarse flint occasional [KEMPTON PARK GRAVEL FORMATION] 5.50 cSPT N=0 (25 for SPT refusal on seating blows at 5.50 m. Possible 70mm/0 for 0mm) 5.80 - 6.00 D 6.50 cSPT N=21 (6,8/6,5,5,5) 7.00 6.43 End of Borehole at 7.00m 9 10 -Hole Diameter Chiselling Inclination and Orientation Casing Diameter Depth Base Depth Top Depth Base Duration Diameter Depth Base Diameter Depth Top | Depth Base | Inclination Orientation

#### Remarks

1. Position CAT scanned, and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Trial pit excavated to 3.00 m with JCB to clear location of obstructions, 3. Hole terminated at 7.00 m - hole could not be progressed further after chiselling. 4. Environmental seal installed from 2.50 m to 4.50 m, 5. Hole relocated to BH2081A, 6. UXO clearance undertaken by a specialist.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 28/06/2021 - 29/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535476.41 N191670.99 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: NC Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Scale Page Number Logged By GI DZ4 BH2041A CP 11.03m AOD AB 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Stratum Description Well Legend Strikes (m) (m) Results Depth (m) Type Light brownish grey GRAVEL. Gravel angular to well 11.03 0.10 rounded medium and coarse flint. [MADE GROUND] Firm brown CLAY 0.30 10.93 [MADE GROUND] Firm greyish brown to black sandy gravelly CLAY with medium cobble and boulder content and occasional 0.50 ES metal timber and plastic fragments. 0.50 - 0.60 0.50 - 0.60 В [MADE GROUND] D 0.50 PID PID = 1 ppm very gravelly from 0.90 to 1.20 m. No cobbles and 1.20 10.73 Firm brownish grey silty CLAY with rare gravel and hydrocarbon cdour. Gravel angular fine to coarse brick. 1.40 ES [MADE GROUND] 1.40 - 1.50 1.40 - 1.50 В D 1.40 PID PID = 2 ppm 1.80 9.83 Firm brownish grey mottled brown slightly organic CLAY with silt partings rare gravel and with black hydrocarbon staining and odour. Gravel angular to rounded fine and medium flint. [ALLUVIUM] 2.50 ES grey mottled brown from 2.50 to 3.60 m. 2.50 - 2.60 2.50 - 2.60 В D PID PID = 1 ppm 2.50 3.00 - 3.50no hydrocarbon staining and odour between 3.00 3.00 - 3.50UT and 3.60 m. Possible gypsum crystals. 3.10 HVP=23 3.10 HVP=34 3.30 3.30 PID PID = 0 ppm3.50 3,50 ES 3.50 - 3.60 3.50 - 3.60 В 3.65 9.23 Dark brown to black clayey pseudo fibrous and D amorphous PEAT with soft grey clay pockets. 3.50 - 4.00 В [ALLUVIUM] 3.50 - 4.00 D 3.50 PID PID = 0 ppm 4 3.65 - 4.00 3.65 - 4.00 D 4.10 7.38 Medium dense dark brownish grey slightly sandy 3.65 - 7.00D GRAVEL. Sand medium and coarse. Gravel angular to 3.80 ES

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

3.50 200 3.50 200

rounded fine to coarse flint occasional quartz.

5

[KEMPTON PARK GRAVEL FORMATION]

#### Remarks

3.80

4.00 - 4.45

4.00

4.10 - 5.00

4.10 - 5.00

4.40

4.40

4.50

4.50 - 5.00

5.00 - 5.45

PID

D

SPT

В

D

ES

PID

EW

D

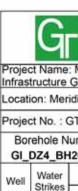
D

PID = 1 ppm

N=23 (4,4/5,6,6,6)

PID = 0 ppm

Position redrilled adjacent to phase 1 borehole to install missing standpipe.
 Position CAT scanned - position clear of services.
 Trial pit excavated to 3.00 m using JCB to remove made ground obstructions.
 Hole progressed through backfilled pit using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 1.50 m to 3.50 m.
 Single install with 50 mm pipe. Response zone from 4.10 m to 7.30 m.



# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 28/06/2021 - 29/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535476.41 N191670.99 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: NC Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ4\_BH2041A 1:25 CP 11.03m AOD AB Sheet 2 of 2 Sample and In Situ Testing Depth Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 5.00 - 6.00 Medium dense dark brownish grey slightly sandy SPT GRAVEL. Sand medium and coarse, Gravel angular to (12,13/10,10,11,1 rounded fine to coarse flint occasional quartz. 0) [KEMPTON PARK GRAVEL FORMATION] 5.40 5.40 PID PID = 0 ppm EW 5.50 5.50 - 6.00 D 5.80 EW 5.80 EW 5.80 EW 6.00 - 6.45 D greyish brown sandy from 6.00 to 7.35 m. Sand is 6.00 - 7.00 В 6.00 SPT N=24 (7,6/7,6,6,5) 6.40 ES 6,40 PID PID = 0 ppm 6.50 - 7.00 7.00 - 7.35 7.00 - 7.45 В D 7.00 N=28 (9,7/8,7,6,7) SPT 7.35 6.93 Stiff dark greysh brown slightly sandy CLAY with 7.40 - 7.80 D extremely closely spaced silty sand partings. Sand 7.40 - 8.40B [LONDON CLAY FORMATION] 7.80 ES 7.80 - 8.30 UT HVP=15 7.90 8 7.90 HVP=78 8.25 - 8.30 8.30 D 8.40 3.68 End of Borehole at 8.40m 9 10 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

Position redrilled adjacent to phase 1 borehole to install missing standpipe.
 Position CAT scanned - position clear of services.
 Trial pit excavated to 3.00 m using JCB to remove made ground obstructions.
 Hole progressed through backfilled pit using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 1.50 m to 3.50 m.
 Single install with 50 mm pipe. Response zone from 4.10 m to 7.30 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 06/07/2021 - 07/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535594.64 N191564.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number GI DZ4 BH1005A CP 12.80m AOD JF 1:25 Sheet 1 of 3 Sample and In Situ Testing Water Depth Level Stratum Description Well Legend Strikes (m) (m) Depth (m) Type Results Dark brown sity fine SAND. [MADE GROUND] 12.80 0.20 Stiff brown mcttled orange and grey slightly sandy gravelly CLAY Sand fine to coarse. Gravel angular to rounded fine to coarse flint. 0.40 ES [MADE GROUND] 0.40 - 0.50 0.40 - 0.50 В 0.50 12.60 Firm dark brown sandy gravel CLAY with medium D cobble content. Sand fine to coarse. Gravel angular to 0.40 PID PID = 0 ppm rounded fine to coarse clinker concrete brick and flint. Cobbles anguar brick and concrete. 0.80 [MADE GROUND] 0.80 - 0.90 0.80 - 0.90 B 0.80 PID PID = 2 ppm1.50 12.30 Dark grey to black sandy clayey GRAVEL with low cobble content black hydrocarbon staining and odour and occasional timber and metal fragments. Sand fine 1.70 ES 1.70 - 1.80 1.70 - 1.80 to coarse. Gravel angular to rounded fine to coarse В D clinker concrete brick and flint. Cobble angular brick 1.70 and concrete. PID PID = 153 ppm [MADE GROUND] 2.80 ES 2.80 - 2.90 В 2.80 - 2.90 D 2.80 PID PID = 34 ppm high cobble content between 3.00 and 3.50 m. 3.20 ES 3.20 PID PID = 9 ppm 3.40 D 3.50 - 4.00medium cobbie and boulder content between 3.50 3,50 CSPT N=22 (2,3/3,5,6,8) and 4.30 m. 4.00 ES 4.00 - 4.10 4.00 - 4.10 B D 4.00 PID PID = 51 ppm 4.20 ES 4.20 PID PID - 19 ppm 4.40 D 4.50 - 5.00 4.50 cSPT N=14 (1,2/3,3,4,4) 5.00 11.30 5 Inclination and Orientation Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

#### Remarks

Position CAT scanned - position clear of services.
 Trial pit excavated to 3,00 m owing to obstructions.
 Hole progressed through backfilled trial pit using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 3.50 m to 5.50 m.
 Single install with 50 mm pipe. Response zone from 6.40 m to 9.20 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 06/07/2021 - 07/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535594.64 N191564.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Dando 2000 | JCB 3CX Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ4\_BH1005A CP 12.80m AOD JF 1:25 Sheet 2 of 3 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Soft grey mottled brown slightly organic CLAY with hydrocarbon cdour. Possibly reworked in area of previous remediation. 5 20 [ALLUVIUM] 5.20 PID PID = 498 ppm 5.50 - 5.95 UT organic with black amorphous peat pockets 5.60 HVP=23 between 5.50 and 5.80 m. 5.60 HVP=5 5.80 7.80 Dark brown slightly sandy clayey pseudo fibrous PEAT with hydrocarbon odour. Sand fine and medium. Possibly reworked in area of previous remediation. [ALLUVIUM] 6.20 6.20 PID PID = 1036 ppm 6.40 D 6.50 EW 6.50 7.00 Medium dense dark grey sandy GRAVEL with green 6.50 - 6.95 6.50 - 7.00 D hydrocarbon sheen and strong odour. Sand fine to coarse. Gravel angular to rounded fine to coarse flint. 6.50 SPT N=17 (2,2/3,4,4,6) Driller noted re-bar - possibly reworked in area of former remediation. [KEMPTON PARK GRAVEL FORMATION] 7.00 EW 7.20 ES 7.20 - 7.30D 7.20 PID PID = 65 ppm 7.40 D 7.50 - 8.00B slightly sandy from 7.50 to 9.20 m. 7.50 **cSPT** N=15 (2,2/3,3,4,5) 8.00 FW 8.00 EW 8.00 EW 8.50 - 9.00 with medium cobble content between 8.50 and 8.50 CSPT N=9 (5,7/3,2,2,2) 9.20 m. Cobbies subangular and subrounded flint. 8.70 6.30 Very stiff dark greyish brown CLAY with extremely closely spaced silty fine sand partings and grey burrows and occasional black lignite fragments. hydrocarbon odour. 9.00 ES 9 [LONDON CLAY FORMATION] 9.20 ES 9.20 4.10 Very stiff dark greyish brown CLAY with extremely 9.20 - 9.50 D closely spaced silty fine sand partings and grey 9.20 PID PID = 58 ppm burrows and occasional black lignite fragments. hydrocarbon cdour. 9.50 - 9.95 UT [LONDON CLAY FORMATION] HVP=150 9.60

# Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Diameter Depth Base Diameter Diameter Depth Base Diameter Diameter Depth Base Diameter Diamet

10

#### Remarks

9.60

9.95 - 10.15

D

HVP=17

Position CAT scanned - position clear of services.
 Trial pit excavated to 3.00 m owing to obstructions.
 Hole progressed through backfilled trial pit using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 3.50 m to 5.50 m.
 Single install with 50 mm pipe. Response zone from 6.40 m to 9.20 m.

oject Name	Meridian	Water HIF	and	Client: Lond	ion Borough	of Enfield		Date: 06/07/2021 - 0	07/07/2021			
frastructure ocation: Men			1	Engineer: G				Co-ords: E535594.64 N191564.41				
oject No. : 0				Limited Crew Name	r RF			Drilling Equipment: I				
Borehole N			Туре	Lev		Logo	ged By	17, 11 - 11 - 11 - 11 - 11 - 11 - 11	Scale Page Numbe			
GI_DZ4_BH	0.000 0.000 0.000		CP	12.80n			JF	1:25	(A)	3 of 3		
ell Water	Sam	ple and In	Situ Testing	1,000,000		Legend		Stratum Descript	ion			
Strikes	Depth (r	m) Type	Results	(m)	(m)		Monu stiff	7/		_		
				10.15	5 3.60		burrows a	dark greyish brown CLAY paced silty fine sand partia and occasional black light bon cdour.  N CLAY FORMATION  End of Borehole at 16	ngs and grey te fragments.	1		
		Casing Diameter meter Depth Base Diameter Depth Top Depth Ba:					Inclination		1			

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 30/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535411.43 N191825.58 Drilling Equipment: Hand Tools | Dando Project No.: GTS-19-250 Crew Name: Terrier Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ3\_WS2005 WS 9.93m AOD 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Concrete with tarmac surfacing. [MADE GROUND] G 0.10 9.93 0.10 Greyish brown gravelly SAND. Sand fine to coarse. Gravel angular to rounded fine to coarse flint brick and [MADE GROUND] 0.40 9.83 Dark brown sandy slightly clayey varying to clayey GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse clinker brick and flint. [MADE GROUND] 1.00 - 1.20 ES 1.00 PID PID = 0 ppm 1.20 - 2.00 L firm sandy gravelly clay band between 1.30 and high cobble content of angular concrete and clinker from 1,35 to 1.60 m. soft light brown sandy gravelly clay band between 1.90 9.53 Soft grey slightly organic CLAY with extremely closely 2.00 - 2.20 2.00 - 3.00 ES spaced orangish brown silt partings and root traces. PID [ALLUVIUM] 2.00 PID = 0 ppminfill from strata above between 2.00 and 2.34 m. dark grey organic from 2.20 to 2.28 m. 2.28 8.03 Firm dark brown to black clayey pseudo fibrous PEAT. [ALLUVIUM] 2.40 - 2.60 ES 2.40 PID PID = 0 ppm 3.00 7.65 3 End of Borehole at 3.00m 4 Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling

techniques 3. Single install with 50 mm pipe. Response zone from 0.50 m to 1.50 m.



Photograph	ic Report
------------	-----------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

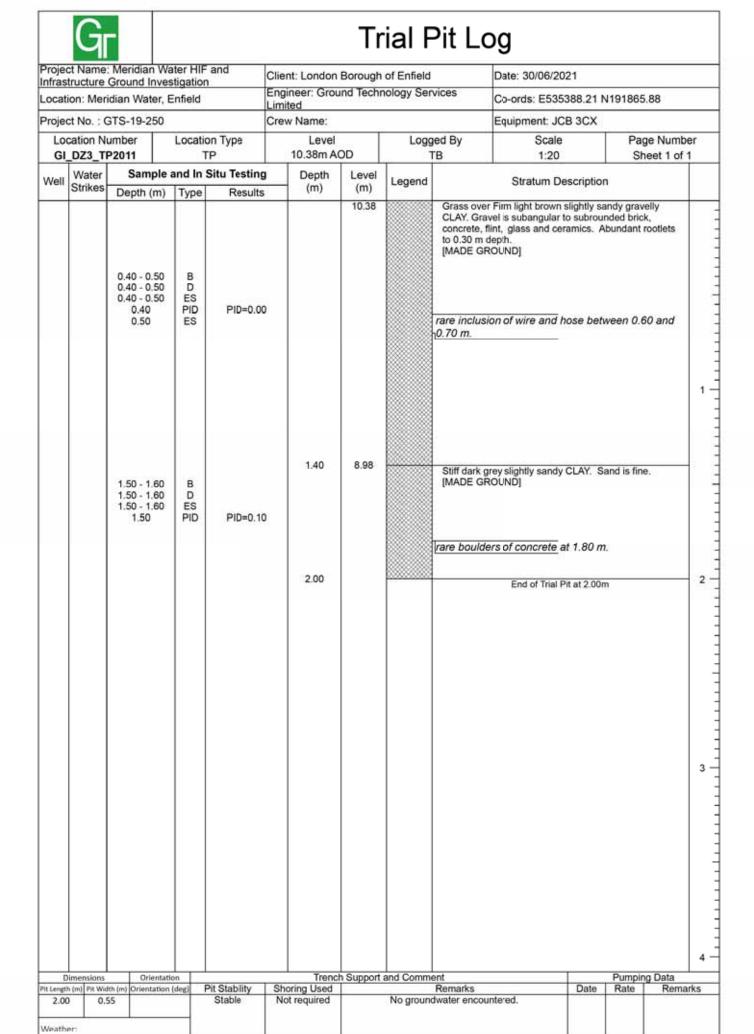
GI\_DZ3\_WS2005

Project ID:

GTS-19-250



WS2005 1 - 3



### Remarks

Position scanned using a CAT prior to digging.
 Trial pit back filled with arising and compacted in 300 mm layers.
 Trial pit excavated under archaeological supervision.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_TP2011

Project ID:

GTS-19-250





1. Before excavation

2. Complete Excavation

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 01/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535380.15 N191971.91 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.77m AOD 1:20 GI\_DZ3\_TP2010 TP TB Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 0.05 10.77 Grass over topsoil. 10.72 [TOPSOIL] Light brown very sandy very silty GRAVEL. Gravel is subangular to subrounded flint, brick, ceramics, concrete. Sand is fine to coarse. [MADE GROUND] 0.40 - 0.500.40 - 0.50 0.40 - 0.50 D ES PID PID=0.30 0.40 concrete cobble at 0.70 m. 1.00 9.77 Large concrete obstruction approx. 1.0 m x 1.0 m x 0.30m (removed by excavator) [MADE GROUND] 1.30 9.47 Stiff orange brown slightly sandy slightly gravelly 1.40 - 1.50 В CLAY. Sand is fine to coarse. Gravel is subrounded 1.40 - 1.50 1.40 - 1.50 fine to coarse flint. D ES [ALLUVIUM] 1.40 PID PID=0.10 1.80 8.97 Stiff dark orange brown sandy gravelly CLAY. Sand is 1.90 - 2.00 1.90 - 2.00 1.90 - 2.00 fine to coarse. Gravel is subangular fine to medium B D 2.00 [KEMPTON PARK GRAVEL FORMATION] 2 ES End of Trial Pit at 2.00m PID PID=0.00 1.90 3

Pumping Data Trench Support and Comment Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.00 Stable Not required No groundwater encountered. 1.00 Weather

4

### Remarks

1. Position scanned using a CAT prior to digging. 2. Concrete broken out between 1.0 - 1.3 m 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated under archaeological supervision.



Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_TP2010

Project ID: GTS-19-250

Project:





1. Before excavation



3. Complete excavation

2. Upper excavation



4. Backfilled



# Trial Pit Log

	$\mathbf{a}$							• • •	۱۵۱ ۱		.og				
Proje Infras	ct Name tructure	Meridia Ground	n Wat Investi	er HIF	and		nt: London				Date: 30/06/20	21			
		dian Wa		_		Eng	ineer: Grou	nd Techr	ology Ser	vices	Co-ords: E535	395.38	N191982	2.16	
Proje	ct No. : C	GTS-19-2	250				w Name:				Equipment: JC	в зсх			
	cation No.		l		on Type P		Level 10.78m A	OD		ed By B	Scale Page Nur 1:20 Sheet 1				
Well	Water	Sam	ple and In Situ Testin			g	Depth	Level	Legend		Stratum De	scription	n		
	Strikes	Depth 0.00			Results	S	(m) 0.05	(m) 10.78		Tarmac					
		0.20 - 0 0.20 - 0 0.20 - 0 0.20 - 0	).30 ).30 ).30	B D ES PID	PID=0.3	0	0.03	10.73		[MADE GROUND]  Subgrade recovered as light brown sandy slightly silty GRAVEL. Gravel is subangular fine to coarse brick, concrete, tarmac. Sand is fine to coarse. Low cobble content of brick [MADE GROUND]					1
		1.10 - 1 1.10 - 1 1.10 - 1	.20	B D ES	22.7		1.00	9.78		bitumen	lack GRAVEL. Grav Infrequent inclusion GROUND]				1
		1.40 - 1 1.40 - 1 1.40 - 1	.50 .50 .50	B D ES	PID=0.4	27	1.30	9.48		occasion	at grey becoming light all indusions of brick GROUND] 1.30 m.		CLAY with	1	111111
		1.72 1.72 - 1 1.75 - 1 1.75 - 1	.85 .85	PID B B D ES	PID=0.2	0	1.65	9.13		Sand is medium	dense yellow brown fine to coarse. Grav flint ON PARK GRAVEL	el is subr	ounded fi	EL. ine to	
		1.75		PID	PID=0.2		2.00				End of Trial P	it at 2.00r	n		3
	0.4	th (m) Orien	ientation tation (d		Pit Stability Stable		Trenct oring Used ot required	Support	and Commo	ent Remarks dwater end	ountered.	Date	Pumpir Rate	ng Data Rema	4 —
Dem						1							_		

Position scanned using a CAT prior to digging.
 Position floor sawed and concrete lifted out by JCB in sections
 Trial pit back filled with arising and compacted in 300 mm layers.
 Trial pit excavated under archaeological supervision.



GI\_DZ3\_TP2009

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250





1. Floor saw



2. Excavated pit



3. Arisings 4. Backfilled

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535341.78 N191842.94 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: Vacuum Extraction Unit Location Number Location Type Level Logged By Scale Page Number GI\_DZ3\_TP2008 TP 9.90m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Results Depth (m) Type 9.90 Grass over firm dark brown sandy slightly gravelly clay topsoil. Gravel is angular to subrounded, fine to coarse, flint, quartzite, brick, concrete, tile and glass. Sand is fine to coarse. Low cobble content of subangular brick. Frequent roots and rootlets. 0.30 B [MADE GROUND] 0.30 ES 0.40 9.50 PID=0.00 0.30 PID Greyish brown, fine to coarse very silty sandy gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick, concrete, glass and tile. Frequent roots and rootets. [MADE GROUND] 0.70 0.70 ES 0.70 PID PID=0.30 1.00 8.90 Firm to stiff brown mottled grey sandy slightly gravelly CLAY. Gravel is subangular to subrounded, fine to medium, flint and quartzite. Sand is fine to medium. 1.20 В Occasional black staining. 1.20 ES [ALLUVIUM] 1.20 PID PID=0.70 silty from 1.60 to 1.90 m. 1.70 В 1.90 8.00 Soft dark brown fibrous slightly gravelly PEAT. Gravel is angular to subangular, fine to medium, flint and 2 quartzite. Slight organic odour. Kempton Park 2.10 2 10 D Gravels possibly encountered at the base of the trial 2.10 ES 2.10 PID PID=0.20 [ALLUVIUM] End of Trial Pit at 2.10m 3

Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) Stable Groundwater seepage at 2.10 m. 1.00 1.00 Weather

4

### Remarks

Position scanned using a CAT prior to digging.
 Trial pit back filled with arising and compacted in 300 mm layers.
 Trial pit excavated under archaeological supervision.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_TP2008

Project ID:

GTS-19-250





1. Prior to excavation

2. Excavation





3. Excavation base

4. Excavation side



# Trial Pit Log

Project Name: Meridian Water HIF and Date: 29/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535303.86 N191852.01 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ3\_TP2007 TP 10.34m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend (m) Strikes (m) Depth (m) Type Results 10.34 Grass over soft, dark brown, sandy, slightly gravelly clay topsoil. Gravel is angular to subrounded, fine to medium, flint, brick and metal. Sand is fine to coarse. 0.15 10.19 Frequent rootlets. [TOPSOIL] 0.30 B Greyish brown, fine to coarse very sandy gravel. 0.30 ES Gravel is angular to subrounded, fine to coarse, flint, 0.30 PID PID=1 20 quartzite, brick, concrete, coal ash, metal and glass. Low cobble content of subangular to subrounded brick and concrete. Frequent lenses of sandy gravelly clay [MADE GROUND] thin concrete slab (0.10m-0.20m thick) at 0.30 m. 0.70 В large pieces of railway track running width of pit at 0.70 ES 0.70 PID PID=83.50 0.70 m. Slight hydrocarbon odour. 0.90 9.44 Soft blackish grey, sandy, slightly gravelly clay. Gravel 1.00 В is angular to subrounded, fine to medium, flint, 1 1.00 quartzite and brick. Sand is fine to medium. ES 1.00 PID=0.00 [MADE GROUND] PID 1.20 9.14 Soft to firm, greyish brown, slightly sandy, slightly gravelly clay. Gravel is subangular to subrounded, fine 1.30 D 1.30 to coarse, flint, quartzite, brick, slate and concrete. ES Sand is fine to coarse. 1.30 PID PID=0.00 [MADE GROUND] 1.50 8.84 Soft, orange brown mottled grey, very sandy, slightly gravelly CLAY. Gravel is angular to subangular, fine to medium, flint and quartzite. Frequent pockets of sand 1.70 В (<0.20m) 1.70 ES [ALLUVIUM] 1.70 PID PID=0.00 1.90 8.44 Grey mottled brown, sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. 2 Sand is fine to coarse. [KEMPTON PARK GRAVEL FORMATION] B 2.20 2.20 End of Trial Pit at 2.20m 2.20 ES 2 20 PID PID=0.00 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 Unstable Groundwater seepage at 2.10 m. 0.60 Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2. Position excavated in grass verge on car park edge 3, Trial pit terminated at 2.20 m due to instability, 4. Trial pit back filled with arising and compacted in 300 mm layers, 5. Trial pit excavated under archaeological supervision.



GI\_DZ3\_TP2007

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250





### 1. Prior to excavation



3. Railway track in pit wall

2. Location prior to excavation



4. Complete excavation



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_TP2007

Project ID:

GTS-19-250



5. Base and groundwater

6. Excavation side



#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Page Number Level Logged By Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 1 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Results TOR SCR RQD Depth (m) Type Asphalt hard standing and concrete. [MADE GROUND] 0.12 (10.04)Concrete sub base [MADE GROUND] 0.15 Greyish brown, fine to coarse sand and gravel. (9.92)Gravel is angular to rounded, fine to coarse, brick, tile, concrete, glass, coal ash, flint and 0.50 0.50 PID PID = 0 ppm [MADE GROUND] 0.85 Dark grey, fine to coarse sand and gravel. (9.89)Gravel is angular to rounded, fine to coarse. 1.00 ES coal ash, concrete, brick and flint. 1.00 - 1.20 [MADE GROUND] 1.00 PID PID = 3 ppm 1.20 В 1.20 В D 1.40 1.50 D 1.50 - 2.00SPT N=11 (1,2/2,3,3,3) 1.65 Firm, grey mottled brown CLAY. Frequent (9.19)buried rootlets and iron oxide staining. [ALLUVIUM] 2.00 ES 2.00 PID PID = 0 ppm 2.25 D 2.50 - 2.95 UT 2.75 Medium dense multicoloured very sandy (8.39)GRAVEL. Gravel is angular to rounded, fine to coarse flint and quartzite. Sand is fine to 2.95 - 3.15 D 3.05 ES [KEMPTON PARK GRAVEL FORMATION] 3.05 PID PID = 2 ppm 3.20 D 3.25 D 3.50 - 4.003,50 N=12 (2,2/3,3,3,3) 4.20 D D 4.25 4.50 - 5.00 В 4.50 **cSPT** N=29 (2,3/5,6,10,8) 5 Hole Diameter Casing Diameter Chisell Drilling Flush

#### Remarks

Depth Base

Diameter

Depth Base

Diameter

Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole commenced using cable percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45.
 Rotary follow on from 8.20 m.
 Sngle install with 50 mm pipe. Response zone from 36.00 m to 41.00 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Tool

Depth You (in) Depth Seise (m) Flush Type Flush Colour Min (%) Max (%)

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 2 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Results TOR SCR RQD Depth (m) Type Medium dense multicoloured very sandy GRAVEL. Gravel is angular to rounded, fine to coarse flint and quartzite. Sand is fine to 5.25 D [KEMPTON PARK GRAVEL FORMATION] 5.50 - 6.00 5.50 **cSPT** N=16 (3,2/3,4,4,5) 6 6.25 D 6.50 - 7.006.50 N=14 (2,3/3,5,3,3) 6.80 Stiff, fissured, dark grey, slightly sandy CLAY. (7.29)Fissures are 5-10 degrees and randomly oriented extremely closely spaced, planar, 7.00 - 7.50 D rough and smooth. Occasional light grey fine sand / silt partings (<1 mm). [LONDON CLAY FORMATION] 7.25 ES PID = 2 ppm 7.25 PID 7.50 - 7.95UT 7.95 - 8.15 D 8.20 - 9.45 C 8.20 Stiff dark greyish brown slightly sandy CLAY with extremely to closely spaced light to dark grey sity sand. Impersistent laminae and partings (<1 mm). [LONDON CLAY FORMATION] AZCL between 8.20 and 8.46 m. 8.66 - 8.90 CS 88 very stiff from 8.90 m. 9 9.45 - 10.95 9.45 N=24 (2,3/4,6,7,7) with occasional white forams and rare black lignite fragments (<20 mm) from 9.50 to with rare iron pyrites nodules (<40 mm) between 9.81 and 11.27 m. 10 Hole Diameter Casing Diameter Chisel **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

1. Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Single install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 3 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Results TOR SCR RQD Depth (m) Type Stiff dark greyish brown slightly sandy CLAY with extremely to closely spaced light to dark grey silty sand. Impersistent laminae and partings (<1 mm). [LONDON CLAY FORMATION] 100 10.55 - 10.80 CS 10.95 - 12.45 C 10.95 SPT N=40 (3,4/7,9,10,14) glaucoritic laminae and partings between 11.27 11.20 and 11.27 m. (1.84)Dark brownish grey clayey SAND with very closely spaced stiff brown clay <20mm pockets. Sand fine and medium slightly glauconitic. [HARWICH FORMATION - SWANSCOMBE 93 MEMBER] with white shell fragments (<10 mm) from 711.52 to 11.58 m. 11.87 - 12.05 thinly to thickly laminated stiff brown clay with clayey sand laminae from 11.84 to 12.05 m. dark green glauconitic sand band from 12.03 12.17 to 12.08 m. gravelly between 12.08 and 12.17 m. Gravel is rounded medium and coarse black and 12.40 - 12.60 ES white flint. 12.40 PID PID = 1 ppm Very stff fissured blueish grey occasionally 12.45 - 13.95 mottlec yellowish and reddish brown CLAY. SPT 12 45 N=32 (3,4/6,9,8,9) Fissures 0-90 degrees extremely to closely spaced planar to undulating polished tight clean. [LAMBETH GROUP - UPPER MOTTLED CLAY] mottled reddish brown from 12.48 to 12.63 100 13.24 - 13.49 CS 13.95 - 15.45 14 N=29 (2,3/6,7,7,9) grey occasionally mottled yellowish and reddish brown from 14.06 to 14.83 m. 100 14.67 CS 14.67 - 14.89 15 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

<sup>1.</sup> Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Single install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 4 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Very stff fissured blueish grey occasionally (-2.13)mottled yellowish and reddish brown CLAY. Fissures 0-90 degrees extremely to closely spaced planar to undulating polished tight [LAMBETH GROUP - UPPER MOTTLED 15.45 - 16.95 C CLAY 15.45 SPT N=50 Very stff fissured blueish grey mottled reddish (4,7/9.12,14,15) brown to purple and yellowish slightly sandy CLAY, Sand fine and medium, Fissures very closely to closely spaced planar to undulating polished tight clean. [LAMBETH GROUP - UPPER MOTTLED CLAY] 16 87 16.32 Very stff light blueish grey occasionally mottled (-4.98)reddish and yellowish brown slightly sandy [LAMBETH GROUP - LOWER MOTTLED CLAYI sandy from 16.54 to 17.77 m. mottled from 16.73 to 17.27 m. 16.95 - 18.45 AZCL between 16.95 and 17.24 m. SPT N=50 (4,9/50 for 16.95 160mm) light grey from 17.27 to 17.77 m. 93 17.77 Light grey clayey SAND. Sand fine and (-6.28)[LAMBETH GROUP - LOWER MOTTLED 18 sandy clay band from 18.17 to 18.24 m. 18.45 - 19.95 AZCL between 18.45 and 18.60 m. 18.45 SPT N=50 (4,8/50 for with pockets of (<170 mm) very stiff fissured dark grey clay and slightly sandy clay between 18.7 and 19.04 m. Probably 19 transition beds towards underlying Upnor 87 grey sandy clay band from 19.04 to 19.13 m. grey silty sand from 19.13 to 19.45 m. Dark brownish grey silty SAND with closely 19.45 spaced burrows (<10 mm) infilled with stiff dark (-7.73)grey clay. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 19 65 - 19 85 ES PID PID = 0 ppmNI and with stiff dark grev Clay <10mm 19.65 aminae from 19.83 to 19.92 m. [LAMBETH GROUP - UPNOR FORMATION] 19.95 - 21.45 C 19.95 AZCL between 19.95 and 20.60 m 20 (-9.41)Hole Diameter Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool epth Base (m) Flush Type Flush Colour Min (%) Max (%)

<sup>1.</sup> Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Sngle install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above esponse zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 5 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD 19.95 N=42 (25 for [LAMBETH GROUP - UPNOR FORMATION] 101mm/13,7,10,1 20.60 Recovered as black GRAVEL. Gravel angular (-9.91)to rounded fine to coarse flint. 53 **ILAMBETH GROUP - UPNOR FORMATIONI** 20.84 Dark brownish grey silty SAND with extremely (-10.56)to very closely spaced burrows infilled (<10 mm) with very stiff dark grey clay and light grey sand. Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] thinly interlaminated with stiff clay from 20.84 to 21.03 m. black 20mm lignite fragment at 21.08 m. 21.45 - 22.95 C gravelly from 21.78 to 21.81 m. Gravel angular to rounded medium to coarse flint. Stiff indistinctly thinly to thickly laminated dark brownish grey CLAY with silty sand laminae. Sand fine and medium. 100 [LAMBETH GROUP - UPNOR FORMATION] 22.75 Dark brownish grey silty SAND with extremely (-11.77)to very closely spaced burrows infilled (<10 mm) with very stiff dark grey clay and light grey 22.95 - 24.45 sand . Sand fine and medium. 23 SPT 22.95 N=50 23.05 [LAMBETH GROUP - UPNOR FORMATION] (4,7/9,11,12,18) (-12.71)Very stff thinly to thickly laminated dark brownish grey CLAY with laminae (<10 mm) of dark to light grey silty sand. Sand is fine and [LAMBETH GROUP - UPNOR FORMATION] interlaminated from 23.47 to 23.85 m. light brown clay lamina from 23.49 to 23.50 100 24 24.45 - 25.95 C [LAMBETH GROUP - UPNOR FORMATION] (-13.01)AZCL between 24.45 and 25.16 m. 25.00 EW 25 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Said (m) Flush Type Flush Colour Min (%) Max (%)

<sup>1.</sup> Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Sngle install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Limited Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 6 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Results TOR SCR RQD Type [LAMBETH GROUP - UPNOR FORMATION] 25.00 EW 25.00 Recovered as dark brownish grey sandy clayey (-14.41)GRAVEL with stiff clay laminae (<10 mm) fragments. Sand fine and medium. Gravel subrounded and rounded fine to coarse flint. [LAMBETH GROUP - UPNOR FORMATION] Dark grey silty SAND with extremely to closely 53 25.51 (-15.12)spaced black sandy silt partings and <10mm 25.70 - 25.90 ES pockets. Sand fine and medium. 25.70 PID PID = 44 ppm [THANET SAND FORMATION] 25.95 - 27.45 [THANET SAND FORMATION] 26 25.95 SPT N=50 (25 for AZCL between 25.95 and 26.50 m. 125mm/50 for 122mm) 26.47 EW Dark grey silty SAND with extremely to closely (-15.91)spaced black sandy silt partings and <10mm pockets. Sand fine and medium. 26.70 EW 73 [THANET SAND FORMATION] 27 27.45 - 28.95 C AZCL between 27.45 and 27.63 m. black sandy silt lamina (5 mm) at 27.77 m. 28 87 28.95 - 30.45 C AZCL between 28.95 and 29.10 m. 29 SPT N=50 (25 for 28.95 85mm/50 for 115mm) 93 firm sandy clay lamina (2 mm) at 29.65 m. 30 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

1. Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Sngle install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

ject Name astructure	Ground In	Water HII	n			-	of Enfiel			Date: 16/07/2021 - 3	0/07/2021		
ation: Mer				Contractor: Ground Technology Services Limited Crew Name: RF / JT+RF+JT						Co-ords: E535494.98 N191838.84			
ject No. : 0	GTS-19-25	50								Drilling Equipment: F	land Tools   Dan	do 20	
Borehole N			Туре	Level Logge					ed By Scale Page Numbe				
GI_DZ3_BH200			+RC	10.04	A	M/ND		1:25	Sheet 7	of 9			
ell Water Strikes	Depth (n		Situ Testing Results	TCR	Coring	RQD	Legend	Depth (Level)		Stratum Descr	ription		
	Depth (n	ii) Type	Results	TON	SCR RQD		1000000		Dark	grey silty SAND with ex	dremely to closely	+	
	30.45 - 31	.95 C		100					pock	ed black sandy silt parti lets. Sand fine and med INET SAND FORMATIO	ium.	3	
	31.95 - 33 31.95		N=50 (B,12/50 215mm)	for								3.	
	33.45 - 34	.95 C		100								3	
	- July -			87					AZCŪ	between 33.45 and	33.67 m.	3	
Hole Diam		Casing	Diameter	Decit T	B		elling		Beds		lling Flush	3	
th Base I	Diameter	Depth Base	Diameter	Depth Top	Depth 8	sase	Duration	Too	×	Depth Yop (in) Depth Sale (in) Flush To	ype Flush Colour   Min (%	) Max	
marks	rannad cone	vete cored a	nd inspection pit di	ua to 1 20 m	Lucino ha		e . nacitina o	lear of ear	nicae 2	Unit and the second second	-No.		

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535494.98 N191838.84 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / JT+RF+JT Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ3\_BH2007 CP+RC 10.04m AOD AM / ND 1:25 Sheet 8 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD 34.95 SPT N=50 (5,6/50 for 35.05 Dark grey silty SAND with extremely to closely (-16.46)95mm) spaced black sandy silt partings and <10mm 35.05 - 35.25 pockets. Sand fine and medium. 35.05 PID PID = 5 ppm THANET SAND FORMATION] Recovered as structureless CHALK composed 35.40 of white slightly gravelly slightly sandy SILT. -25.01)Gravel subangular extremely weak low density. Frequent fragmented flint. [WHITE CHALK SUBGROUP] fragmented large flint between 35.05 and 27 35.15 m. FINI between 35.05 and 35.40 m. fragmented very large flint between 35.25 36 and 35.40 m. [WHITE CHALK SUBGROUP] AZCL between 35.40 and 36.45 m. Flint scrubbed. 36.45 - 37.95 36.45 Very weak medium density white CHALK with SPT 36.45 N=48 (-25.36)light grey mottling. Fractures 0-90 degrees very (4,8/12,10,13,13) closely to medium spaced (NI/160/460) planar to undulating smooth tight and clean. CIRIA [WHITE CHALK SUBGROUP] DINI - SPT disturbance from 36.45 to 36.87 37 probable black sponge bed between 36.79 and 36.81 m. 100 99 96 NP=17mm. black sponge bed from 36.95 to 36.98 m. 37.40 - 37.65 CS very small finger flints between 37.00 and 37.36 m. NP=16mm. 37.95 - 39.45 AZCL between 37.95 and 38.10 m. 38 37.95 SPT N=50 (7,15/50 for 287mm) DINI - SPT disturbance between 38.10 and 38.38 m. fragmented small flint at 38.32 38.50 38.50 EW NP=15mm. 38.61 - 38.81 CS 93 77 pseudo flint at 38.71 m. 39 39.45 - 41.00 39.45 N=50 (3,11/50 for 285mm) 40 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (in) Depth Base (in) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole commenced using cable percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45.
 Rotary follow on from 8.20 m.
 Sngle install with 50 mm pipe. Response zone from 36.00 m to 41.00 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

Gr		Deep Borehole Log													
Project	Name	: Meridian Ground Ir	Wate	er HIF	and	Client: Lo	ndon B	oroug	h of Enfiel	d	Date: 16/07/2021 - 30/07/2021				
		idian Wate		_		Contracto Limited	or: Grou	and Te	chnology S	Services	Co-ords: E535494.98 N191838.84				
Project	No. : 0	GTS-19-25	50			Crew Na	me: RF	/ JT+F	RF+JT		Drilling Equipment: Hand Tools   Dando 20	000			
12000		umber			Туре	2000	evel	31		ged By	Scale Page Number	e Number			
GI_DZ3_BH2007				+RC		4m AO		A	M/ND	1:25 Sheet 9 of 9					
				-	Situ Testing Results	_	Coring	RQD	Legend	Depth (Level)	Stratum Description				
Sunt		Depth (r 40.66 - 40	SWANTS	Type	1133413	97	SCR			41.00	Very weak medium density white CHALK with light grey mottling. Fractures 0-90 degrees very closely to medium spaced (NI/160/460) planar to undulating smooth tight and clean. CIRIA Grade A3 [WHITE CHALK SUBGROUP]	41 -			
										(-26.41)		42 -			
												43			
Depth 8		eter Diameter	Depth		Diameter Diameter	Depth Top	Depth		elling Duration	Toc	Drilling Flush	45 — ix (%)			

1. Position CAT scanned, concrete cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 m to 2.50 m, from 6.20 m to 8.20 m and from 19.45 to 21.45. 5. Rotary follow on from 8.20 m. 6. Single install with 50 mm pipe. Response zone from 36.00 m to 41.00 m. 7. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 8.2 - 9.45 2007 9.45 - 10.95





2007 10.95 - 12.45 2007 12.45 - 13.95



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 13.95 - 15.45 2007 15.45 - 16.95





2007 16.95 - 18.45 2007 18.45 - 19.95



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 19:95 - 21:45 2007 21:45 - 22:95





2007 22.95 - 22.45 2007 22.95 - 24.45



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 24 45 - 22 95 2007 25 95 - 27 45





2007 27.45 - 28.95 2007 28.95 - 30.45



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 30.45 - 31.95 2007 31.95 - 33.45





2007 33.45 - 34.95 2007 34.95 - 36.45



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2007

Project ID:

GTS-19-250





2007 36.45 - 37.95 2007 37.95 - 39.45



#### Shallow Borehole Log Project Name: Meridian Water HIF and Date: 15/07/2021 - 21/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535468.74 N191830.50 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC Dando 2000 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ3\_BH2006 CP 10.01m AOD TB / AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Stratum Description Well Legend Strikes (m) (m) Depth (m) Type Results 0.00 Tarmac 0.09 10.01 0.00 PID PID = 0 ppm [MADE GROUND] Light brown very gravelly SAND. Gravel is sub-0.09 rounded to sub-angular, fine to coarse of flint, brick, concrete, tarmac. 0.40 В [MADE GROUND] 0.40 D 0.40 ES 0.40 PID PID = 6 ppm becomes dark blackish brown and gravel fraction includes occasional clinker from 0.80 to 1.15 m. 1.15 9.92 Concrete obstruction across full area of pit base breaker used to remove. 1.30 8.86 [MADE GROUND] Dark blackish brown very gravelly SAND. Gravel is sub-rounded to sub-angular, fine to coarse of flint, brick, concrete, tarmac and clinker. 1.60 8.71 [MADE GROUND] Firm, dark grey silty CLAY. Possible hydrocarbon В odour near top of unit. 1.80 [ALLUVIUM] 1.80 ES 1.80 PID PID = 1 ppm 2.00 8.41 2 2.00 - 2.50 Soft, greenish grey mottled brown, slightly gravelly slightly sandy CLAY. Gravel is angular to subangular, fine to medium, flint and quartzite. [ALLUVIUM] 2.50 ES 2.50 - 2.95 UT 2.50 - 3.20 2.50 - 3.20 B D PID 2.50 PID = 1 ppm 2.95 - 3.10 D 2.95 8.01 Soft, grev, sardy CLAY. Sand is fine to medium. 3.00 ES Frequent decaying roots (<5mm) and rootlets. 1no. 3.00 PID PID = 1 ppm peat inclusion (<10mm). 3.20 - 4.20 В [ALLUVIUM] 3.50 N=16 (6,4/4,4,3,5) 3.60 7.06 Medium dense multicoloured very sandy silty GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. [KEMPTON PARK GRAVEL FORMATION] 4.00 ES 4.00 - 4.20 D 4.00 PID PID = 0 ppm 4.20 - 5.20 В 4.50 EW 4.50 EW 4.50 CSPT N=18 (1,1/5,5,5,3) 4.90 EW 4.90 FW

#### Remarks

Depth Base

Hole Diameter

4 92

Diameter

EW

Depth Base

Casing Diameter

Diameter

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found in base of pit - JCB used to remove obstruction.
 Trial pit dug to 2.00 m and backfilled.
 Hole completed using cable percussive techniques through the backfilled trial pit into the top of the London Clay Formation.
 Environmental seal installed from 2.00 m to 2.00 m and from 3.60 m to 7.00 m.

Depth Top Depth Base Duration

Chisel

Tool

5

Orientation

Inclination and Orientation

Depth Top | Depth Base | Inclination

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 15/07/2021 - 21/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535468.74 N191830.50 Location: Meridian Water, Enfield Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC Dando 2000 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ3\_BH2006 CP 10.01m AOD TB / AM 1:25 Sheet 2 of 2 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Results Type Medium dense multicoloured very sandy silty 5.00 - 5.20 D GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 5.20 - 6.20 B [KEMPTON PARK GRAVEL FORMATION] 5.40 CSPT N=12 (4,4/3,3,3,3) 5.60 5.60 EW 6.00 - 6.20 D 6 6.20 - 7.00B 6.40 N=15 (5,3/3,4,4,4) 6.80 - 7.00 D 7.00 7.00 6.41 D Stiff, fissured, slightly sandy micaceous CLAY. 7.00 - 8.00 B Fissures are randomly oriented, undulating, planar, rough and smooth. Occasional light grey, fine sand / silt partings (<1mm). Sand is fine. 7.30 ES [LONDON CLAY FORMATION] 7.30 PID PID = 4 ppm 7.80 - 8.00 D 8.00 8.00 - 8.45 U 8.45 - 8.60 D 8.60 3.01 End of Borehole at 8.60m 9

# Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation 8.60 150 7.00 150

10

#### Remarks

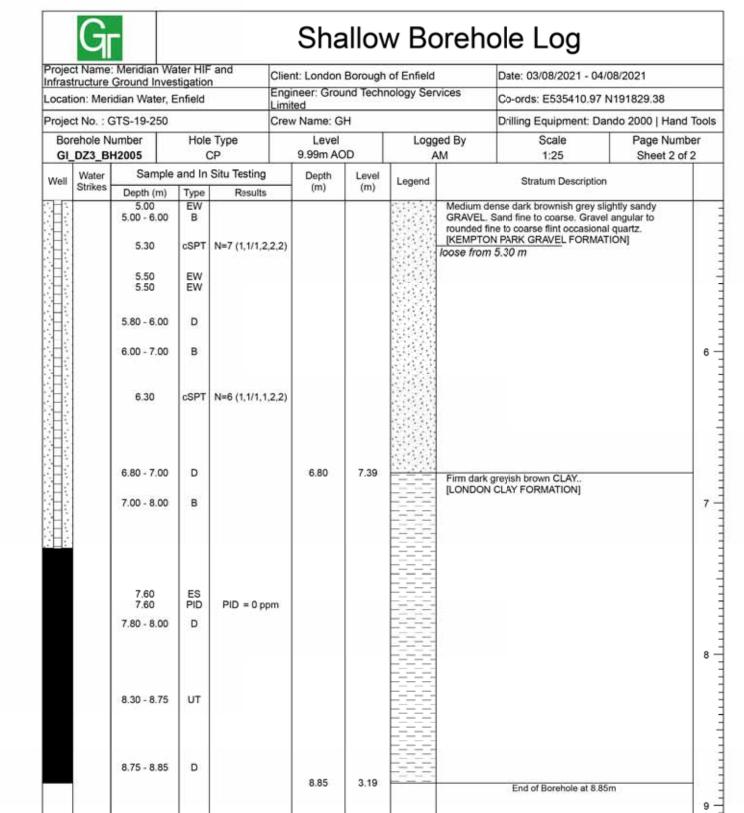
Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction. Trial pit dug to 2.00 m and backfilled.
 Hole completed using cable percussive techniques through the backfilled trial pit into the top of the London Clay Formation.
 Environmental seal installed from 2.00 m to 2.00 m and to 2.50 m.
 Dual install with 50 mm pipe. Response zones from 0.50 m to 2.00 m and from 3.60 m to 7.00 m.



# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 03/08/2021 - 04/08/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535410.97 N191829.38 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: Dando 2000 | Hand Tools Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ3\_BH2005 CP 9.99m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Results Type 0.00 - 1.00 Concrete core with tarmac running surface 0.10 9.99 [MADE GROUND] Greyish brown very sandy GRAVEL. Sand fine to 0.20 ES coarse. Gravel angular to rounded fine to coarse flint 0.20 PID PID = 0 ppm brick and concrete. 0.40 9.89 [MADE GROUND] Soft varying to firm dark greyish brown to brown 0.50 slightly sandy slightly gravelly CLAY. Sand fine to 0.50 PID PID = 0 ppm coarse. Gravel angular to rounded fine to coarse flint brick and clinker. [MADE GROUND] 0.80 - 1.00D 1.00 - 2.00В 1.20 - 1.65 1.20 9.59 Firm grey mottled brown slightly organic CLAY with 1.20 SPT N=4 (1,1/1,1,1,1) frequent orangish brown silt partings. 1.30 ES [ALLUVIUM] PID PID = 0 ppm 1.80 - 2.00 D 2.00 - 3.00 В 2 2.40 ES firm dark brown clayey amorphous peat bed 2.40 - 2.85 D between 2.40 and 2.60 m. SPT N=21 (1,2/4,5,6,6) 2.40 2.60 8.79 240 PID PID = 0 ppmMedium dense dark brownish grey slightly sandy GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse flint occasional quartz. 2.80 - 3.00 D [KEMPTON PARK GRAVEL FORMATION] 3.00 ES 3.00 - 4.00B 3.00 PID PID = 0 ppm 3.30 **cSPT** N=9 (3,2/2,2,2,3) 3.80 - 4.00 D 4.00 EW 4.00 EW 4.00 - 5.00 4.20 **cSPT** N=11 (2,2/2,3,3,3) 4.80 EW 4.80 EW D 4.80 - 5.005 5.00 FW Inclination and Orientation Hole Diameter Casing Diameter Chisel Depth Base Depth Base Diameter Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seal installed from 1.60 m to 2.60 m. 4. Single install with 50 mm pipe. Response



Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

8.40 200 8.00 200

10 -

#### Remarks

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Environmental seal installed from 1.60 m to 2.60 m.
 Single install with 50 mm pipe. Response zone from 2.70 m to 7.30 m.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Hole Type Borehole Number Page Number Logged By Scale GI DZ3 BH2004 CP+RC 10.29m AOD JF / ND 1:25 Sheet 1 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Results TOR SCR RQD Depth (m) Type Tarmac over concrete [MADE GROUND] 0.22 - 0.30 0.22 - 0.30 B 0.22 Brown slightly silty GRAVEL subangular to (10.29) D subrounded fine to coarse concrete, brick, flint 0.22 - 0.30ES 0.30 and type 1 gravel PID PID = 0 ppm 0.22 (10.07)[MADE GROUND] 0.30 - 0.60 0.30 - 0.60 B Grey sightly sandy slightly silty GRAVEL D 0.60 Sand is fine to coarse. Gravel is subangular to 0.50 - 0.60B (9.99)subrounded fine to coarse flint, brick, concrete, 0.50 - 0.60D type 1, rebar and disused pipes. 0.50 - 0.60 ES [MADE GROUND] PID 0.50 PID = 0 ppmGreyish brown slightly sandy GRAVEL. Sand is 0.60 - 0.80В fine to medium. Gravel is subangular to 0.60 - 0.80D subrounded fine to coarse flint, brick, concrete, 0.70 - 0.80ES type 1, rebar and disused pipes and empty fuel 0.70 PID PID = 1 ppm 0.80 - 1.20B [MADE GROUND] 0.80 - 1.20 D greyish red brown at 0.80 m. 1.00 - 1.10 ES concrete slab at 0.90 m. 1.00 PID PID = 0 ppm1.50 1.20 - 1.50 1.20 - 1.50 В boulders of concrete, waste plastic pipes, (9.69)D covers, terracotta tiles and plastic bags from 1.40 ES 1.30 to 1.50 m. 1.40 PID PID = 0 ppm Reddish brown very sandy GRAVEL. Sand is 1.50 ES fine to coarse. Gravel is subangular to 1.50 - 1.60 В subrounded fine to coarse flint. 1.50 - 1.60 D [KEMPTON PARK GRAVEL FORMATION] 1.50 PID PID = 0 ppm 1.60 - 2.20 1.60 - 2.20 В D 1.90 ES 1.90 PID PID = 0 ppm2.20 - 3.20 2.30 - 2.75 B 2.50 D Dense yellow brown very sandy GRAVEL to (8.79)SPT 2.30 N=48 very gravelly SAND. Sand is fine to coarse. (5,6/5 12, 15, 16) Gravel is subangular to subrounded fine to 2.50 ES 2.50 PID = 0 ppm [KEMPTON PARK GRAVEL FORMATION] 3.20 - 3.65 3.20 - 4.20 D В 3.20 SPT N=36 (4,5/7,8,9,12)3.70 - 4.20 D 4.20 - 4.65 D Low cobble content of flint between 4.20 and 4.20 - 5.20 В 5.20 m 4.20 SPT N=35 (5,7/8,9,10,8) 4.70 - 5.20 D 5 Hole Diameter Casing Diameter Chisell Drilling Flush

#### Remarks

Depth Base

Diameter

Depth Base

Diameter

1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m, 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppe, Response zone from 35.00 m to 41.00 m, 8. Hole grauted above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Tool

Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Page Number Borehole Number Hole Type Logged By Scale JF / ND GI\_DZ3\_BH2004 CP+RC 10.29m AOD 1:25 Sheet 2 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type Dense yellow brown very sandy GRAVEL to very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to 5.20 - 5.65 D 5.20 - 6.20 5.20 - 6.20 В [KEMPTON PARK GRAVEL FORMATION] D medium dense from 5.20 m. 5.20 SPT N=26 (5,4/5,7,7,7) 6 6.20 - 6.70 6.20 - 6.70 6.70 - 7.50 6.70 - 7.50 В loose between 6.70 and 7.15 m. D 6.70 SPT N=7 (1,0/1,2,2,2) 7.15 N=14 (1,0/3,4,3,4) 7.50 - 7.90D 7.50 Greyish brown very sandy GRAVEL. Sand fine 7.50 - 7.95B (7.79)to coarse. Gravel angular to rounded fine to [KEMPTON PARK GRAVEL FORMATION] 7.95 - 8.20 В 7.95 Very stff laminated dark brown slightly sandy 7.95 - 8.25 D (2.79)CLAY with very closely spaced silty sand laminae (<1 mm). Sand is fine. 8.20 - 8.65 UT [LONDON CLAY FORMATION] 8.30 ES 8.30 PID PID = 0 ppm8.65 - 8.85 D 8.85 N=21 (2,2/4,5,5,7) 9 9.30 - 9.49 CS Stiff thinly laminated brownish grey sandy and 9.30 - 9.95 slightly shelly locally glauconitic CLAY with occasional angular and rounded medium and coarse black gravel. Sand is fine to medium. 9.60 100 [HARWICH FORMATION - SWANSCOMBE (2.34)glauconitic sand from 9.76 to 9.82 m. clay bed with fine to coarse rounded flint 9.95 - 11.35 C gravel between 9.82 and 9.90 m. 10 -Hole Diameter Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (m) Depth Seie (m) Flush Type Flush Colour Min (%) Max (%)

1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppc. Response zone from 35.00 m to 41.00 m. 8. Hole grouted above response zone to 0.30 m and grout left to cure

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Page Number Borehole Number Hole Type Logged By Scale JF / ND GI\_DZ3\_BH2004 CP+RC 10.29m AOD 1:25 Sheet 3 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type TOR SCR RQD Results 9.95 SPT N=50 (4,5/50 for Stiff thirty laminated brownish grey sandy and 247mm) slightly shelly locally glauconitic CLAY with occasional angular and rounded medium and coarse black gravel. Sand is fine to medium. 10.30 - 10.55 ES [HARWICH FORMATION - SWANSCOMBE 10.30 PID PID = 7 ppmshell fragments between 10.03 and 10.07 m. 64 10.92 Fine to medium very dark greenish grey and (0.69)11 black SAND with abundant shelly fragments. 11.00 [HARWICH FORMATION - SWANSCOMBE (-0.63)MEMBER] 11.10 Brownish grey clayey SAND, with a thin basal (-0.71)gravel bed from 11.08 m. Gravel is rounded 11.35 - 12.95 medium black flint. 11.35 N=26 (2,3/5,6,7,8) [HARWICH FORMATION - SWANSCOMBE MEMBER] Stiff bluish grey mottled red purple and occasionally orange CLAY. [LAMBETH GROUP - UPPER MOTTLED AZCL across SPT interval between 11.35 11.96 - 12.16 ES and 11.80 m. 11.96 PID PID = 4 ppm75 12.55 - 12.78 CS 12.95 - 14.45 13 12.95 SPT N=32 (2,4/6,8,10,8)107 14 Firm bluish grey mottled red and orange sandy (-0.81)CLAY with rare small pebbles. [LAMBETH GROUP - UPPER MOTTLED 14.45 - 15.95 14.45 N=50 (4,10/50 for AZCL between 14.45 and 14.55 m. 210mm) 15.00 D 15 Hole Diameter Casing Diameter Chisell Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%) 1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppc. Response zone from 35.00 m to 41.00 m. 8. Hole grouted above response zone to 0.30 m and grout left to cure

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Page Number Borehole Number Hole Type Level Logged By Scale JF / ND GI\_DZ3\_BH2004 CP+RC 10.29m AOD 1:25 Sheet 4 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Firm bluish grey mottled red and orange sandy CLAY with rare small pebbles. [LAMBETH GROUP - UPPER MOTTLED CLAY] gravel of fine rounded flint between 15.12 and 15.14 m. 53 AZCL between 15.35 and 15.95 m. 15.60 - 15.80 CS 15.95 - 16.95 C 16 15.95 SPT N=50 (6,11/50 for 161mm) 90 16.60 Very dense fine light grey clayey SAND with (-3.93)black organic rich intervals up to 200mm thick. [LAMBETH GROUP - LOWER MOTTLED CLAY] 16.95 - 18.45 C stiff very sandy clay band from 16.60 to 17 16.95 SPT N=50 (7,9/50 for 150mm) dark grey organic sandy CLAY at 16.80 m. poor recovery between 16.95 and 18.45 m. SPT void in core indicates recovered core is from top of run. 40 18 gravelly from 18.20 to 18.22 m. Gravel is fine to medium angular to rounded flint. 18.45 - 19.45 AZCL between 18.45 and 19.30 m. 18.45 SPT N=50 (6,13/50 for 15 19 gravelly from 19.30 to 19.45 m. Gravel is fine to medium subrounded flint. 19.45 - 20.35 C Stiff thinly laminated bluish grey mottled red 19.45 N=53 (15 for (-6.31)purple sandy CLAY. 90mm/50 for LAMBETH GROUP - LOWER MOTTLED 131mm) 11 AZCL from 19.45 to 20.25 m. Very poor recovery. 20 Hole Diameter Casing Diameter Chisell **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%) 1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppc. Response zone from 35.00 m to 41.00 m. 8. Hole grouted above response zone to 0.30 m and grout left to cure

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Borehole Number Hole Type Logged By Page Number Scale JF / ND GI\_DZ3\_BH2004 CP+RC 10.29m AOD 1:25 Sheet 5 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Type Results TOR SCR RQD Stiff thirty laminated bluish grey mottled red purple sandy CLAY. LAMBETH GROUP - LOWER MOTTLED 20.35 - 21.55 C AZCL from 20.35 to 21.15 m. Very poor 29 21 Firm bluish grey mottled orange sandy CLAY (-9.16)with rare small pebbles. [LAMBETH GROUP - LOWER MOTTLED 21.40 CLAY] (-10.86)Very stff laminated dark grey CLAY with closely 21.55 - 22.85 spaced clayey sand beds up to 40mm thick and rare shell fragments. Sand is fine. [LAMBETH GROUP - UPNOR FORMATION] pebble bed from 21.40 to 21.75 m. Medium and coarse gravel rounded black flints. 22 19 22.85 - 24.35 22.85 SPT N=50 (5,6/50 for 255mm) 23 87 23.90 - 24.15 CS 24 24.35 - 25.85 C 25.00 EW 25 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (in) Depth Sale (in) Flush Type Flush Colour Min (%) Max (%) CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppc. Response zone from 35.00 m to 41.00 m. 8. Hole grouted above response zone to 0.30 m and grout left to cure harden installing headstards.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 30/06/2021 - 16/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Borehole Number Hole Type Logged By Page Number Scale JF / ND GI\_DZ3\_BH2004 CP+RC 10.29m AOD 1:25 Sheet 6 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type Very stff laminated dark grey CLAY with closely 25.00 EW spaced clayey sand beds up to 40mm thick and 25.06 - 25.22 rare shell fragments. Sand is fine. CS [LAMBETH GROUP - UPNOR FORMATION] 53 pebble bed from 25.67 to 25.82. Medium and coarse gravel subrounded black flints 25.85 - 27.35 C Very dense dark greenish grey silty SAND with (-11.11)25.85 SPT N=50 (25 for extremely to closely spaced black sandy silt 95mm/50 for 26 partings and pockets (<10 mm). Sand fine and 137mm) [THANET SAND FORMATION] No recovery between 25.85 and 27.35 m. 26.48 EW 0 27 PID 27.25 PID = 12 ppm 27.35 - 27.60 27.35 - 28.85 ES C SPT 27.35 N=50 (25 for 100mm/50 for 90mm) 28.00 FW 28 67 28.60 - 28.85 CS 28.85 - 30.35 C 29 100 30.00 - 30.22 CS 30 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

#### Remarks

1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hele commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppe. Response zone from 35.00 m to 41.00 m. 8. Hele grauted above response zone to 0.30 m and grout left to cure before installing headworks.

Project Name: Meridian Water HIF and Infrastructure Ground Investigation					Client: London Borough of Enfield					Date: 30/06/2021 - 16/07/2021							
Location: Meridiari Water, Enfield					Contractor: Ground Technology Services Limited						Co-ords: E535268.16 N191865.61						
Sanda mana and a state of the sandard and the					Crew Name: NC / MH+NC+MH				Drilling Equipment: Hand Tools   JCB 3CX   Dando 2000   Commachio 405								
	Borehole Number Hole Type GI_DZ3_BH2004 CP+RC			Level 10.29m AOD			Logged By JF / ND				Scale Page Num 1:25 Sheet 7 of						
Vell Wat	00		_	Situ Testing			Coring		Legend	Depth (Level)		)	Stratur	n Descript	ion		
Vell Strik		(m) T) (11.85 S (0.88 C) (13.35 S (13.3	C C C C C C C C C C C C C C C C C C C	N=50 (6,9/50 198mm)	) for	100 100	SCR F	ROD	Legend	(Level)	extre parti med	mely to one and it is in the second in the s	ark gree closely s pockets	enish grey spaced bla (<10 mm)	silty SAI ack sand ). Sand f	y silt	31
	34,85 - 3 34,85 - 3		ES C			93				34.60 (-15.53)	glauc subro Bullhe Very light Frac unst: [WH	orite co cunded to ead bed weak me grey mo tures me ained. CI ITE CHA	ated bi lints fro s. edium d edium s edium s RIA Gra LK SUB	vel to cob ack occa om 34.45 ensity whi rrowing at baced, tiglide B3. IGROUP] 15.35 m.	to 34.6 te CHAL the top.	brown 0 m. K with	34
	lameter	-		Nameter		ib. 7-	D# 0		elling	-					Flush	I pro-rect	
	ostructions, 3. Tr	al pit excav	ug to 1.	Diameter  20 m using hand sing JCB to 2.00	tools - m to ci	ear conc	rete rubble a	ices.			cable pe	rcussive te	chniques.		istall ed trial	Min (%)	Max (

#### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 30/06/2021 - 16/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI DZ3 BH2004 CP+RC 10.29m AOD JF / ND 1:25 Sheet 8 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) RQD Depth (m) Type Results TOR SCR Very weak medium density white CHALK with 34.85 (3,5/10,10,11,17) light grey mottled burrowing at the top. PID PID = 0 ppm Fractures medium spaced, tight clean and 35.00 EW unstained. CIRIA Grade B3. 35.00 EW [WHITE CHALK SUBGROUP] AZCL between 35.35 and 36.35 m. 33 36 36.35 - 37.85 fragmented nodular large flint between 36.35 36,35 N=39 and 36.46 m. (6,5/9.10,10,10) DINI from 36.55 to 35.58 m. NP=21mmfragmented large flint between 36.69 and 36.72 m. DIF between 36.86 and 36.94 m. 37 DINI between 36.98 and 37.20 m. 37.10 - 37.45 CS 93 93 68 Natural fracture 30 degrees partly open and infilled with calcite between 37.24 and 37.27 DINI between 37,43 and 37,46 m. coarse gravel sized flints from 37.60 to 37.64 37.85 - 38.65 putty chalk due to SPT disturbance between 37.85 SPT N=28 (4,5/6,6,7,9) 37.85 and 38.34 m. 38 53 9 38 34 - 38 48 CS DINI between 38.48 and 38.65 m with cobble flint at base. 38.65 - 39.35 С AZCL between 38.65 and 39.35 m. Flint cobble stuck in catcher, rest of run assumed scrubbed out. 39 39.35 - 40.85 C putty chalk due to SPT disturbance between 39.35 N=48 39.35 and 39.80 m. (4,7/7,11,11,19)

# Hole Diameter Casing Diameter Chiselling Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Top Depth Base Duration Tool Depth Top Depth

medium flint at 39.95 m.

40

#### Remarks

1. CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hele commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppe. Response zone from 35.00 m to 41.00 m. 8. Hele grauted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 30/06/2021 - 16/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535268.16 N191865.61 Limited Drilling Equipment: Hand Tools | JCB 3CX | Project No.: GTS-19-250 Crew Name: NC / MH+NC+MH Dando 2000 | Commachio 405 Borehole Number Hole Type Logged By Page Number Scale GI\_DZ3\_BH2004 CP+RC 10.29m AOD JF / ND 1:25 Sheet 9 of 9 Coring Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (Level) RQD Depth (m) Type Results TOR SCR Very weak medium density white CHALK with light grey mottled burrowing at the top. Fractures medium spaced, tight clean and 40.26 - 40.44 CS unstained. CIRIA Grade B3. [WHITE CHALK SUBGROUP] NP=24mm. 83 65 small fragmented flints between 40.27 and 40.32 m. 40.85 SPT N=50 (4,6/50 for 235mm) 41.29 End of Borehole at 41.29m (-24.31)42 43 45 Hole Diameter Casing Diameter Chiselling Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Min (%) Max (%) Beeth Yop (m) Depth Beie Imiliflush Type Flush Col 40.85 Polymer CAT scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques. Unable to install casing due to obstructions. 3. Trial pit excavated using JCB to 2.00 m to clear concrete rubble and obstructions. 4. Cable percussive drilling commenced through backfilled trial pit to 8.20 m. Borehole not progressed further with cable percussive techniques due to rig fault. 5. Environmental seals installed from 7.30 m to 8.20 m and 17.40 to 19.40 m. 6. Rotary follow on from 8.20 m. 7. Single install with 50 mm ppe. Response zone from 35.00 m to 41.00 m. 8. Hole gravited above response zone to 0.30 m and grout left to cure before installing headworks.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 9.3 - 11.2 2004 11.35 - 12.95





2004 12:95 - 14:45 2004 14:45 - 15:95



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 15.95 - 16.95 2004 16.95 - 18.45





2004 18.45 - 19.45 2004 19.45 - 20.35



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 20.35 - 21.55 2004 21.55 - 22.85





2004 22.85 - 24.35 2004 24.35 - 25.85



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 25.85 - 27.35 2004 27.35 - 28.85





2004 28.85 - 30.35 2004 30.35 - 31.85



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 31.85 - 33.35 2004 33.35 - 34.85





2004 34.85 - 36.35 2004 36.35 - 37.85



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ3\_BH2004

Project ID:

GTS-19-250





2004 37.85 - 38.65 2004 39.35 - 40.85



# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535184.59 N191870.31 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ3\_BH2003 CP 10.47m AOD 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 0.00 - 1.00 Topsoil [MADE GROUND] 0.20 0.20 10.47 ES Greyish brown, Sandy gravel. Gravel is angular to PID = 0 ppm 0.20 PID subangular, fine to coarse, brick, limestone, concrete, flint and quartzite. Sand is fine to coarse. [MADE GROUND] 0.50 0.50 PID PID = 2 ppm0.80 ES D 0.80 - 1.000.80 PID = 1 ppm 1.00 - 2.001.20 **cSPT** N=7 (1,2/3,1,1,2) 1.20 10.27 Dark brown, very clayey, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick and concrete. [MADE GROUND] 9.27 1.60 ES 1.60 Soft light brown, sandy, gravelly clay. Gravel is PID PID = 0 ppm 1.60 angular to rounded, fine to coarse, flint, quartzite, brick 1.80 - 2.00 D and concrete. Sand is fine to coarse. [MADE GROUND] 2.00 - 3.00 В 2.00 8.87 Medium dense light orangish brown very sandy GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse, flint and quartz 2.20 - 2.65 D [KEMPTON PARK GRAVEL FORMATION] 2.20 SPT N=17 (2,3/3,3,5,6) 2.30 ES 2.30 PID PID = 0 ppm 2.80 - 3.00D 3.00 - 4.00B 3.20 CSPT N=30 (6,6/8,8,7,7) 3.80 - 4.00 D 3.80 - 4.00 D 4.00 - 5.00 4.00 - 5.00 В 4.00 8.47 Medium dense greyish brown very sandy GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse, flint and quartz 4.20 cSPT N=21 (3,3/5,5,5,6) [KEMPTON PARK GRAVEL FORMATION] 4.50 EW 4.50 EW 4.50 EW 4.50 EW 4.50 EW black hydrocarbon staining and odour between 4.80 ES 4.80 - 5.00 4.80 - 5.00 4.80 and 7.20 m. D 5 D Inclination and Orientation Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 2.00

1. Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using cable percussive techniques into the top of the London Clay Formation. 3. Dual install with 50 mm pipe. Response zones from 0.5 m to 1.50 m and from 2.00 m to 8.10 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/07/2021 - 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535184.59 N191870.31 Project No.: GTS-19-250 Crew Name: GH Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.47m AOD 1:25 GI\_DZ3\_BH2003 CP Sheet 2 of 2 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results PID PID = 3 ppm Medium dense greyish brown very sandy GRAVEL. 5.00 - 6.00 5.00 - 6.00 В Sand fine to coarse. Gravel angular to rounded fine to coarse, flint and quartz. 5.20 cSPT N=22 (2,4/4,6,6,6) [KEMPTON PARK GRAVEL FORMATION] 5.80 - 6.00 D 5.80 - 6.00 6.00 EW 6 6.00 - 7.00 6.00 - 7.00 В В 6.10 EW 6.10 EW 6.20 CSPT N=22 (3,4/5,5,6,6) 6.80 - 7.00 6.80 - 7.00 D D 7.00 - 8.00 В 7.20 ES hydrocarbon sheen and odour at 7.20 m. N=22 (4,4/5,5,6,6) PID = 106 ppm 7.20 CSPT 7.20 PID 7.60 6.47 Very stiff aminated dark greyish brown slightly sandy CLAY with very closely spaced silty sand laminae (<1 mm). Sand is fine. 7.80 - 8.00 D [LONDON CLAY FORMATION] 7.90 ES 7.90 PID = 568 ppm PID 8.20 - 8.65 U 8.65 - 8.75 D 8.75 2.87 End of Borehole at 8.75m 9

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Book Diameter Book Diameter Book Diameter Book Diameter Book Diameter Depth Top Depth Base Diameter Book Diameter Depth Base Diameter Book Diame

10

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the top of the London Clay Formation.
 Dual install with 50 mm pipe.
 Response zones from 0.5 m to 1.50 m and from 2.00 m to 8.10 m.

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535444.80 N191626.52 Project No.: GTS-19-250 Crew Name: Drilling Equipment: Hand Tools | Archway Dart Borehole Number Hole Type Level Logged By Scale Page Number 11.04m AOD 1:20 GI\_DZ2\_WS2009 WS Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Results Depth (m) Type Light brown gravelly slight clayey varying to clayey SAND. Sand fine to coarse. Gravel angular to rounded brick concrete and flint. [MADE GROUND] 1.10 - 1.30 ES 1.10 PID PID = 0 ppm1.20 - 2.00 high cobble content from 1.45 to 1.72 m. Cobbles are angular concrete. 1.72 11.04 Firm grey to dark brown slightly gravelly slightly 1.80 - 2.00 ES organic CLAY with extremely closely spaced orangish 1.80 PID PID = 3 ppm brown silt partings and closely spaced gravelly sand <20mm pockets. Sand fine to coarse. Gravel angular to rounded fine to medium flint brick and glass. 2.00 - 3.00 L 2 [MADE GROUND] 9.32 Firm dark grey organic CLAY with extremely closely spaced black silt partings and root traces. [ALLUVIUM] 2.20 - 2.40 ES PID = 24 ppm PID 2.20 fissured grey slightly organic with brown partings from 2.62 to 2.82 m. Fissures 0-90 degrees, extremely closely spaced planar smooth very tight clean. 3.00 8.93 End of Borehole at 3.00m Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using dynamic sampling techniques



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_WS2009

Project ID:

GTS-19-250



WS2009 1 - 3

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 04/08/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535495.90 N191826.95 Drilling Equipment: Hand Tools | Dando Project No.: GTS-19-250 Crew Name: Terrier Borehole Number Hole Type Level Logged By Scale Page Number 10.00m AOD GI\_DZ2\_WS2008A WS 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Asphalt / Hard standing. [MADE GROUND] G 0.10 0.12 10.00 Greyish brown, very gravelly, fine to coarse sand. Gravel is angular to rounded, fine to coarse, coal ash, brick, concrete, flint, quartzite, tile and glass. [MADE GROUND] 0.90 9.88 Stiff fissured grey organic CLAY with extremely closely spaced silt and black organic partings. Fissures 0-90 degrees very closely to closely spaced planar smooth tight with organic because it is 5". 1.00 - 2.00 tight with orangish brown silt infill. [ALLUVIUM] 1.30 - 1.50 ES 1.30 PID PID = 0 ppm light brown mottled grey slightly organic orangish brown silt partings from 1.45 to 2.10 m. 2.00 - 3.00 L 2 firm brownish grey with white shell <2mm fragments from 2.10 to 2.38 m. Not fissured. rootlets from 2.10 m. 2.38 9.10 Firm dark brown clayey amorphous PEAT with occasional decayed roots and white shell <2mm 2.50 - 2.70 ES fragments. 2.50 PID PID = 0 ppm [ALLUVIUM] black from 2.80 to 2.88 m. greyish brown slightly sandy clayey from 2.88 to 3.00 7.62 3 End of Borehole at 3.00m 4 Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling

techniques to provide gas monitoring pipe not installed in WS2008 3. Single install with 50 mm pipe. Response zone from 0.50 m to 1.20 m.



Photograp	hic Re	port
-----------	--------	------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_WS2008A

Project ID:

GTS-19-250



WS2008A 1.2 - 3.0

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.90 N191826.95 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Drilling Equipment: Hand Tools | Archway Dart Borehole Number Hole Type Level Logged By Scale Page Number 1:20 GI\_DZ2\_WS2008 WS 10.00m AOD Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Asphalt / Hard standing. [MADE GROUND] 10.00 0.12 Greyish brown, very gravelly, fine to coarse sand. Gravel is angular to rounded, fine to coarse, coal ash, brick, concrete, flint, quartzite, tile and glass. [MADE GROUND] 0.80 9.88 Stiff dark greysh brown slightly sandy gravelly CLAY. Sand fine to coarse. Gravel angular to rounded fine to coarse flint and brick. [MADE GROUND] 1 rootlets from 1.00 m. 1.13 9.20 Very stiff fissured dark grey slightly organic CLAY with 1.20 - 1.40 ES extremely closely spaced black organic partings and 1.20 - 2.00 orangish brown silt partings rootlets and root traces PID PID = 0 ppm and infill. Fissures 0-90 degrees extremely closely spaced planar to undulating smooth tight with infill. [ALLUVIUM] greyish mottled orangish brown from 1.35 to 2.10 2.00 - 3.00 L 2 dark greyish brown organic from 2.10 to 2.36 m. 2.36 8.87 Very stiff dark brown silty very organic CLAY with white 2.40 - 2.60 ES shell fragments (<2 mm) and rootlets to 2.96 m. 2.40 PID PID = 0 ppm [ALLUVIUM] stiff clayey very organic silt from 2.65 to 2.92 m. 3.00 7.64 3 End of Borehole at 3.00m 4 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling

techniques 3. Hole backfilled on completion with bentonite pellets



Photograph	ic Report
------------	-----------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_WS2008

Project ID:

GTS-19-250



WS2008 1 - 3



# Trial Pit Log

Projec	ct Name	: Meridian V Ground Inv	Vater HIF	and	Clie	nt: London	Borough	of Enfield		Date: 29/06/20	21				
Location: Meridian Water, Enfield						ineer: Grou	ind Techr	Co-ords: E535348.98 N191599.69							
		STS-19-250			Lim	w Name:		Equipment: JCB 3CX							
Location Number   Location Type						Level		Logo	ged By	Scale Page Number					
GI_DZ2_TP2014			TP TP			10.50m A	ТВ		1:20	Sheet 1 of 1					
Well	Water	Sample	e and In	Situ Testin	g	Depth	Level	Legend		Stratum De	scription				
	Strikes	Depth (m)	) Type	Results	s	(m)	(m)	Logona		0.0.0	осприон				
		0.07 - 0.10 0.07	ES PID	PID=0.1	0	0.05	10.50 10.45			GROUND]				1	
			9.530(0)	P10=0.1	U				Subgrad gravel si	le recovered as sand ubrounded medium to	y partially o coarse fl	cement int and	ted brick.		
		0.25 - 0.35 0.25 - 0.35								GROUND] e from hardstandin	a hetwee	n 0 05	and	-	
									0.55 m.		goome	.,, 0.00		-	
						0.55	9.95								
						100000	0.00		and grav	ker recovered as bla rel. Suspected Asbes	ck brown y tos cemer	yellow o	obbles	1-	
		0.70 - 0.80 0.70 - 0.80	D .						[MADE	GROUND]				-	
		0.70 - 0.80 0.70	ES PID	PID=0.2	0									=	
		1.00	В	1 10-0.2					1					_ =	
		1.00	6											1 -	
														]	
														-	
														=	
						4.55								-	
						1.55	8.95	XX	Firm dar	k blackish grey sligh UMI	tly sandy s	ilty CLA	AY.	-	
		1.70 - 1.80 1.70 - 1.80						_ X _ X	Strong h	ydrocarbon odour	between	1.55 a	nd 2.00	2	
		1.70 - 1.80	ES	PID=4.6				XXXX	m.					1	
		1.70	PID	P10≈4.6				X-X-2						1	
						2.00				End of Trial P	it at 2.00m			2 -	
														=	
														=	
														=	
														-	
														-	
														_	
														-	
														3 —	
														=	
														=	
														-	
														]	
														-	
														-	
														=	
														=	
														4 -	
_ D	imensions	Orient				Trenci	l h Support	and Comm				Pumpir	ng Data		
	h (m) Pit Wid	ith (m) Orientatio		Pit Stability Stable	Sh	oring Used ot required		chief.	Remarks dwater enc	ountered.	Date	Rate	Rema	rks	
oncoes.	70 m	- California de la Cali	_	on openings				a a a a a							
Weath Rema															
CHILI	ains														

1. Position scanned using a CAT prior to digging, 2. Position floor sawed and concrete lifted out by JCB in sections 3. Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated under archaeological supervision.



GI\_DZ2\_TP2014

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250





1. Floor saw



3. Complete excavation



4. Spoil



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_TP2014

Project ID:

GTS-19-250



5. Backfilled



# Trial Pit Log

Project Name: Meridian Water HIF and Date: 29/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535211.04 N191673.99 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ2\_TP2006 TP 10.56m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Results Type 10.56 Asphalt / Hard standing (See ES1). 0.05 PID [MADE GROUND] 0.10 10.46 Greyish brown fine to coarse sand and gravel. Gravel is angular to rounded, flint, quartzite, brick, concrete, glass, tile and coal ash. Low cobble content of subrounded concrete and brick. Low boulder content of subrounded concrete. Slight hydrocarbon odour. [MADE GROUND] 0.50 В 0.50 ES 0.50 PID PID=2.20 0.70 9.86 Firm brown slightly sandy slightly gravelly clay. Gravel is angular to subrounded, fine to coarse, flint, quartzite, brick, concrete, glass and coal ash. Sand is fine to coarse. Frequent buried rootlets. Several lenses / bands of red / brown sandy clayey material 1.00 В (<0.1m thick) (See ES4). Rare pockets of white / blue 1.00 ES material (<100mm) (See ES4). Small pockets of greenish material (<10mm) (See ES4). Low cobble 1.00 PID PID=3.00 content of subrounded concrete and low boulder content of subangular concrete. [MADE GROUND] Red / brown band at 1.00 m. concrete slab at edge of pit at 1.10 m. 1.50 D red / brown band at 1.50 m. 1.70 8.86 Firm to stiff brown mottled grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint and quartzite. Frequent iron oxide staining. [ALLUVIUM] 2.00 B 2 2.00 ES PID=0.00 2.00 PID 2.60 7.96 Brown mottled grey, stained bluish green, slightly clayey fine to coarse SAND and GRAVEL. Gravel is angular to rounded fine to coarse flint and quartzite. [KEMPTON PARK GRAVEL FORMATION] 3.00 3.00 3 End of Trial Pit at 3.00m 3.00 ES PID=0.30 4 Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 Stable Groundwater struck at 2.60 m. 0.60 Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2, Surface tarmac broken out by JCB, 3, Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated under archaeological supervision.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_TP2006

Project ID:

GTS-19-250





### 1. Prior to excavation



1. Prior to excavation



2. Complete excavation

3. Base and sides



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_TP2006

Project ID:

GTS-19-250





4. Side backwall and groundwater





6. Backfilled



# Trial Pit Log

Project Name: Meridian Water HIF and Date: 15/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535192.68 N191721.65 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ2\_TP2005 TP 10.33m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend (m) Strikes (m) Depth (m) Type Results 10.33 Reinforced concrete with rebar. [MADE GROUND] 0.20 10.13 Greyish brown very sandy gravel. Gravel is angular to 0.25 В rounded fine to coarse flint, quartzite, coal ash, 0.25 ES concrete and brick. Medium cobble content of 0.25 PID PID=0.30 subrounded brick and concrete. Sand is fine to coarse. [MADE GROUND] 0.50 9.83 Soft to firm, brownish grey sandy slightly gravelly clay. Sand is fine to coarse. Slight hydrocarbon odour, Frequent buried roots and rootlets. 0.55 D 0.55 ES 0.55 PID PID=0.20 IMADE GROUNDI 0.90 0.90 ES 1.00 9.33 0.90 PID PID=9.50 Blackish grey fine to coarse very sandy gravel. Gravel is angular to subrounded fine to coarse coal, ash, brick and flint. Low cobble content of subrounded coal ash, 1.20 В Sand is fine to coarse. [MADE GROUND] 1.20 ES 1.20 PID PID=0.20 1.50 8.83 Firm grey mottled dark grey slightly gravelly clay Gravel is angular to subrounded, flint, brick and tile. Land drain at 1.60m. Slight organic odour. 8.63 1.70 [MADE GROUND] Firm grey mottled dark grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, flint and quartzite. [ALLUVIUM] 2.00 D 2 2.00 ES PID=0.00 2.00 PID 2.30 D 2.60 В 2.80 7.53 Greyish brown gravelly fine to coarse SAND. Gravel is angular to rounded, fine to medium, flint and quartzite. Heavy hydrocarbon odour and oily. 3.00 3.00 [ALLUVIUM] 3 3.00 ES End of Trial Pit at 3.00m 3.00 PID=86.50 4 Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 0.50 Stable Not required Groundwater struck at 2.80 m. Very oily. Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2. Position floor sawed and broken out by JCB, 3, Oily sheen and hydrocarbon odour in groundwater. 4.Trial pit back filled with arising and compacted in 300 mm layers, 34. Trial pit excavated under archaeological supervision.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_TP2005

Project ID:

GTS-19-250





1. Complete excavation

2. Base and sides





# Trial Pit Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535185.79 N191780.23 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ2\_TP2004 TP 10.53m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.53 Reinforced concrete with rebar. [MADE GROUND] 10.23 0.30 Blackish grey fine to coarse very sandy gravel. Gravel is angular to rounded, fine to coarse, flint quartzite, brick, coal ash, slag and concrete. 0.50 В [MADE GROUND] 0.50 ES 0.50 PID PID=2.60 0.70 9.83 Greyish brown very clayey gravelly fine to coarse sand. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick and concrete. High cobble and boulder content of subrounded brick and concrete. Frequent lenses of sandy gravelly clay (<0.2m thick). 1.00 В Black tarry paint like substance toward base. 1.00 ES [MADE GROUND] 1.00 PID PID=1.10 1.30 9.23 Soft greenish grey mottled grey slightly sandy slightly gravelly CLAY Gravel is subangular to subrounded, fine to coarse, flint and quartzite. Sand is fine to 1.50 В coarse. Slight organic odour. [ALLUVIUM] 1.50 ES 1.50 PID=2.30 Very sandy and gravelly from 1.90 to 2.50 m. 2.00 D 2 2.50 8.03 Greyish brown fine to coarse very sandy GRAVEL. Gravel is angular to rounded fine to coarse flint and quartzite. Sand is fine to coarse. Strong hydrocarbon odour and black staining throughout. [KEMPTON PARK GRAVEL FORMATION] 3.00 3.00 3 End of Trial Pit at 3.00m 3.00 ES PID PID=647.20 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Shoring Used Remarks Date Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 Stable Groundwater struck at 3.00 m. Hydrocarbon odour. 0.60 Weather

#### Remarks

1. Position scanned using a CAT prior to digging, 2, Surface concrete broken out by JCB, 3. Hydrocarbon odour in groundwater, 4, Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated under archaeological supervision.



GI\_DZ2\_TP2004

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250





### 1. Broken out prior to excvation



3. Complete excvation

### 2. Excavation



4. Base and groundwater



Photographic	Report
--------------	--------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_TP2004

Project ID:

GTS-19-250



5. Spoil

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 27/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535183.56 N191816.54 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.72m AOD GI\_DZ2\_TP2003 TP AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.72 Reinforced concrete with rebar. [MADE GROUND] 0.30 10.42 Blackish grey fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, concrete, brick, coal ash, slag, tile, glass and possible 0.50 В ASBESTOS. 0.50 ES [MADE GROUND] 0.50 PID PID=1.30 0.90 D 0.90 ES 1 0.90 PID PID=1.20 1.50 9.22 Stiff brown mcttled grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 1.70 Frequent buried and decaying rootlets. 1.70 ES [ALLUVIUM] PID PID=1.00 2 2.20 8.52 Brown mottled grey fine to coarse very sandy GRAVEL. Gravel is angular to rounded fine to coarse D 2.30 flint and quartzite. Sand is fine to coarse. 2.30 ES [KEMPTON PARK GRAVEL FORMATION] PID PID=0.00 2.70 B 270 End of Trial Pit at 2.70m 2.70 ES 2.70 PID PID=0.00 3

Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.50 Stable Groundwater struck at 2.60 m. 0.60 Weather

4

#### Remarks

 Position scanned using a CAT prior to digging, 2. Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated under archaeological supervision.



GI\_DZ2\_TP2003

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250





1. Spoil



3. Side and groundwater

2. Complete excavation



4. Base and groundwater

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 1 of 10 Sample and In Situ Testing Corina Water Stratum Description Well Legend Strikes (Level) Results TOR SCR RQD Depth (m) Type Greyish brown slightly clayey, fine to coarse, sand and gravel. Gravel is angular to rounded, fine to coarse, coal ash, concrete, flint, 0.20 ES quartzite, brick. High cobble content of sub-0.20 - 1.00 B angular to sub-rounded brick and concrete. PID 0.20 PID = 0 ppm [MADE GROUND] geotextile membrane and mesh at 0.15 m. 0.50 0.50 PID PID = 0 ppm 1.00 concrete slab (0.20m thickness) at 1.00 m. 1.00 PID PID = 1 ppm 1.05 concrete slab (0.20m thickness) at 1.20 m. concrete slab with rebar (0.20m thickness) at concrete slab (0.20m thickness) at 1.60 m. 2.00 Soft greyish brown slightly sandy gravelly clay. (11.31)Gravel is angular to sub-rounded, fine to medium, flint, quartzite, coal ash and brick. Sand is fine to coarse. 2.30 В [MADE GROUND] 2,30 ES 2.30 - 2.50 D PID 2.30 PID = 1 ppm 2.50 - 3.00 B 2.50 SPT N=10 (2,2/3,2,2,3) 2.90 Soft to firm, fissured greenish grey mottled dark (9.31)grey CLAY. Fissures are randomly orientated, extremely close to very closely spaced, undulating and smooth. 3.20 [ALLUVIUM] 3.20 PID PID = 1 ppm 3.30 - 3.50D 3.50 - 3.95UT 3.50 Soft dark grey sandy CLAY. Hydrocarbon (8.41)[ALLUVIUM] 3.80 Medium dense multicoloured slightly sandy silty GRAVEL. Gravel is angular to subrounded, 3.95 - 4.15 D fine to coarse, quartzite and flint. Sand is fine to coarse Strong hydrocarbon odour and oily 4.20 ES [KEMPTON PARK GRAVEL FORMATION] PID = 75 ppm 4.20 PID

Hole Diameter Casing Diameter Chiselling Drilling Flush
Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Top Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth Base Duration Tool Depth Top Depth

5

#### Remarks

4.40

4.40

4.50 - 5.00 4.50 В

D

N=21 (3,4/4,4,6,7)

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

#### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Limited Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 2 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD Medium dense multicoloured slightly sandy silty GRAVEL. Gravel is angular to subrounded, fine to coarse, quartzite and flint. Sand is fine to coarse. Strong hydrocarbon odour and oily D 5.30 [KEMPTON PARK GRAVEL FORMATION] 5.50 - 6.00 5.50 **cSPT** N=21 (3,4/4,4,6,7) 6 6.30 D 6.50 - 7.00 6.50 N=28 (2,3/4,7,9,8) 7:30 D 7.50 **cSPT** N=30 (2,3/3,8,8,11) 7.95 - 8.00B 8.30 D 8.50 - 9.00 8.50 cSPT N=13 (2,3/3,4,3,3) 9 9.20 - 9.50D 9.20 Stiff dark grey slightly sandy CLAY. Sand is fine (7.51)to medum. Occasional light grey sand partings [LONDON CLAY FORMATION] 9.50 ES 9.50 - 11.00 C 9.50 - 9.95 UT 9.50 PID PID = 1 ppm

### Remarks

D

ES

Depth Base

Casing Diameter

Diameter

9.95 - 10.15

Diameter

Hole Diameter

Depth Base

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the Lendon Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole grouted above response zone to 9.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Chisell

Tool

10

Drilling Flush

Depth Yop (in) Depth Seie (in) Flush Type Flush Colour Min (%) Max (%)

# Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 12/07/2021 - 30/07/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Logged By Page Number GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 3 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) RQD Depth (m) Type Results TOR SCR 10.00 PID PID = 0 ppm Stiff dark grey slightly sandy CLAY. Sand is fine to medum. Occasional light grey sand partings [LONDON CLAY FORMATION] 10.34 - 10.50 CS 73 11.00 - 12.20 11.00 Firm to stiff dark grey thinly laminated CLAY. 11.00 N=20 (2,2/5,5,4,6) (2.11)Laminations are extremely closely spaced with thin silt partings. Rare pyritised nodules up to 30mm. Rare glauconitic sandy pockets. [LONDON CLAY FORMATION] 92 12 12.20 N=27 (4,4/5,6,8,8) 12.60 - 13.70 C 13 118 13.17 - 13.42 CS very sandy from 13.27 to 16.62 m. Sand is fine to medium. SPT 13.90 N=33 (3,7/5,8,9,11)14 14.30 - 15.80 C 9mm pyrite nodule at 14.77 m. 15 -Drilling Flush Hole Diameter Casing Diameter Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (in) Depth Sale (in) Flush Type Flush Colour Min (%) Max (%)

# Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 6.00 m to 10.20 m and from 17.00 to 19.00 m.5. Rotary follow on from 10.20 m.6. Single install with 50 mm pipe. Response zone from 42.00 m to 47.00 m.7.
 Hole growled above response zone to 0.30 m and growt left to oure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 4 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD 15.03 - 15.24 CS Firm to stiff dark grey thinly laminated CLAY. Laminations are extremely closely spaced with thin silt partings. Rare pyritised nodules up to 30mm. Rare glauconitic sandy pockets. [LONDON CLAY FORMATION] 100 silty from 15.10 to 15.50 m. elongated pyritised nodule, 30mm x 10mm at 15.11 m. (0.31)glaucoritic sand pockets between 15.30 and 15.50 m. 15.80 - 17.30 Very dense dark brownish grey clayey silty 15.80 SPT N=50 (5,11/50 for SAND with thin clay beds glauconitic sand beds 100mm) and shelly beds. Sand is fine. Clay is firm 16 brown. Shell fragments are up to 10mm long. [HARWICH FORMATION - SWANSCOMBE MEMBER] brownish grey clay bed with black organic sandy pockets from 15.65 to 15.70 m. AZCL between 16.00 and 16.50 m. 80 pebble bed from 16.55 to 16.60 m. Pebbles are medium and coarse gravel sized rounded flints. 16.80 - 17.00 ES Very stff fissured blueish grey mottled reddish PID = 2 ppm 16.80 PID and occasionally orangish brown CLAY. Fissures 0-90 degrees extremely to closely spaced planar to undulating polished tight and [LAMBETH GROUP - UPPER MOTTLED CLAY] 17.30 - 18.50 C 17.30 SPT N = 34(3,5/3,8,9,11)grey occasionally mottled reddish and 117 orangish brown between 17.80 and 19.04 m. 18 18.80 - 20.30 SPT 18.80 N=42 (3,5/9,9,11,13) 19 19.00 - 21.20 100 slightly sandy from 19.70 to 20.05 m. Sand fine and medium. 20 Drilling Flush Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (in) Depth Seise (m) Flush Type Flush Colour Min (%) Max (%)

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By Scale GI DZ2 BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 5 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD Very stff fissured blueish grey mottled reddish and occasionally orangish brown CLAY. Fissures 0-90 degrees extremely to closely spaced planar to undulating polished tight and 20.30 20.30 - 21.50 N=70 (6,15/70 for 20.30 SPT (-5.29)[LAMBETH GROUP - UPPER MOTTLED 145mm) CLAY sandy from 20.05 to 20.30 m. Very dense blueish grey mottled yellowish brown and yellowish brown mottled blueish grey clayey SAND. Sand is fine and medium. [LAMBETH GROUP - UPPER MOTTLED 108 CLAY closely spaced dark brown iron concretions (<50 mm) between 20.60 and 21.45 m. yellowish brown mottled reddish brown and 21.20 - 22.70 C blueish grey from 21.15 to 20.30 m. 21.40 Very stff greenish grey mottled yellowish brown (-8.99)SPT N=50 (25 for 21.50 sandy CLAY. Sand is fine and medium. [LAMBETH GROUP - LOWER MOTTLED 140mm/50 for 100mm) CLAYI 22.00 22 Greenish grey silty glauconitic SAND with very (-10.09)closely to closely spaced burrows (<50 mm) infilled with firm brown sandy clay. Sand is fine 90 and medium. [LAMBETH GROUP - LOWER MOTTLED CLAY C 22.70 - 25.80 23.00 23 [LAMBETH GROUP - LOWER MOTTLED (-10.69)CLAY AZCL between 23.00 and 24.47 m. 0 24 Recovered as grey and brown sandy clayey GRAVEL. Gravel is angular to rounded fine to coarse flint. Probable Lower Mottled Clay to Upnor Formation transition. [LAMBETH GROUP - LOWER MOTTLED (-11.69)Very stff thinly to thickly laminated dark brownish grey CLAY with dark to light grey silty 24.75 sand laminae and infilled burrows (<10 mm). (-13.16)Sand is fine and medium. 24.95 - 25.15 ES [LAMBETH GROUP - UPNOR FORMATION] 25 PID = 0 ppm 24.95 PID Hole Diameter Casing Diameter Chisell **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Septimises (m) Flush Type Flush Colour Min (%) Max (%)

# Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cable percussive techniques into the top of the Lendon Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole growled above response zone to 9.30 m and growt left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Page Number Borehole Number Hole Type Level Logged By Scale GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 6 of 10 Sample and In Situ Testing Corina Water Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD Very stff thinly to thickly laminated dark brownish grey CLAY with dark to light grey silty sand laminae and infilled burrows (<10 mm). 25.25 Sand is fine and medium. (-13.44)[LAMBETH GROUP - UPNOR FORMATION] 80 Very dense dark brownish grey silty SAND with extremely to very closely spaced burrows infilled (<10 mm) with very stiff dark grey clay and light grey sand. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 25.80 - 26.70 25.80 SPT N=50 (4,6/50 for 270mm) 26 93 26.70 - 28.20 C 27 closely spaced laminae with occasional white shell fragments (<20 mm). with some white shell fragments (<20 mm) 97 between 27.37 and 27.81 m. DINI with clay laminae between 27.95 and 28.00 FW 28.20 m. 28.20 - 30.20 28.20 SPT N=50 (3,8/50 for 256mm) 28 42 Very stff thinly to thickly laminated dark (-13.94)brownish grey CLAY with dark to light grey silty sand laminae and infilled borrows (<10 mm). Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] interlaminated between 28.68 and 28.86 m. interlaminated between 28.94 and 29.63 m. 29 75 [LAMBETH GROUP - UPNOR FORMATION] AZCL between 29.73 and 30.20 m. Possible 29.79 EW over drill. 30.00 EW 30 **Drilling Flush** Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool epth Seie In Flush Type Flush Colour Min (%) Max (%)

# Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By GI\_DZ2\_BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 7 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD [LAMBETH GROUP - UPNOR FORMATION] 30 20 - 31 70 30.20 C Very stff thinly to thickly laminated dark (-18.42)brownish grey CLAY with silty sand laminae. Sand is fine and medium. [LAMBETH GROUP - UPNOR FORMATION] interlaminated between 30.41 and 30.47 m. 30.60 sandy gravel bed from 30.47 to 30.60 m. Gravel rounded fine to coarse flint. Dark brownish grey gravelly very clayey SAND. Sand is fine and medium. Gravel is rounded fine and medium flint. 64 [LAMBETH GROUP - UPNOR FORMATION] 31 clayey sandy fine to coarse gravel band from 31.16 31.01 to 31.07 m. [LAMBETH GROUP - UPNOR FORMATION] (-19.29)AZCL between 31.16 and 31.70 m. 31.70 - 33.20 31.70 Recovered as greyish brown silty SAND 31.70 N=50 (6,12/50 for (-19.85)(Thanet) intermixed with dark brownish grey 235mm) gravelly clayey SAND (Upnor). Probable core recovered following from AZCL above. 32 Transiton from Lambeth Group to Thanet Sand [LAMBETH GROUP - UPNOR FORMATION] Very dense dark grey silty SAND with extremely (-20.39)to closely spaced black sandy silt partings and <10mm pockets. Sand fine and medium. 100 32.50 - 32.70 ES [THANET SAND FORMATION] 32.50 PID PID = 1 ppm 33 black sandy silt lamina (3 mm) at 33.13 m. 33.20 - 34.70 C SPT N=50 (7,17/50 for 33.80 110mm) 100 34 C 34.70 - 36.20 SPT drilling disturbed between 34.70 and 34.94 m. Greyish brown. 35 Drilling Flush Hole Diameter Casing Diameter Chisel Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (m) Depth Seve (m) Flush Type Flush Colour Min (%) Max (%)

# Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cable percussive techniques into the top of the Lendon Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole growled above response zone to 9.30 m and growt left to cure before installing headworks.

ject Nan astructur	ne: Meridia re Ground I	n Wat	er HIF	and	Client: Lo	ndon Borou	ugh of Enfie	ld		Date: 12/07/202	1 - 30/07	7/2021				
	eridian Wa		_	(	Contracto imited	r: Ground	Technology	Services		Co-ords: E535463.95 N191543.03						
Project No. : GTS-19-250						ne: RF+CB				Drilling Equipme			0   Han	d Tools		
	Number BH2087			Type +RC		evel Im AOD	100	gged By DW / ND	)	Scale 1:25	IIIIdailo	Page Number Sheet 8 of 10				
Wate		nple a	and In	Situ Testing		Coring	Legend	Depth		Stratum (	Descriptio	n		T		
Strike	S Depth	(m)	Туре	Results	TCR	SCR RQ		(Level)	Van	dense dark grey s	III. CAND	unith on	etromoli	_		
	36.20 - 3	17 70	c		100				to cl <10: [TH/	iosely spaced black mm pockets. Sand ANET SAND FORM	sandy sii fine and r (ATION)	It parting	gs and	36		
	36.20 - 3	<i>y</i> 70	3		100				SPT 336.35	driling disturbed 5 m. Greyish brov	betweer vn.	36.20	) and	37		
	37.70 - 3 37.70		C SPT	N=50 (8,14/50 120mm)	for					drilling disturbed Om. Greyish brov		37.70	) and	38		
	39.20 - 4	0.70	С		100									39		
					63					ng disturbed betw reyish brown.	veen 39.	76 and	40.22	40		
Hole Dia	ameter		Casing	Diameter			hiselling				Drilling F	lush				
oth Base	Diameter	Depti	Base	Diameter	Depth Top	Depth Base		Tool		Depth Yop (m) Depth Sale (m)			Min (%)	Max		
marks																

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Hole Type Borehole Number Level Page Number Logged By Scale **GI DZ2 BH2087** CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 9 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Type Results TOR SCR RQD Very dense dark grey silty SAND with extremely to closely spaced black sandy silt partings and <10mm pockets. Sand fine and medium. [THANET SAND FORMATION] AZCL between 40.20 and 40.70 m. 40.45 - 40.65 ES 40 45 PID PID = 1 ppm 40.70 - 42.20 Drilling disturbed between 40.70 and 40.85 40.70 SPT N=50 (5,6/50 for m. Greyish brown. 285mm) 40.85 Weak, medium density very pale greyish white -20.93)CHALK. Fractures are closely to medium spaced, clean and infilled with fine sand and 41.10 - 42.60 C very pale greyish white silt, tight, horizontal to inclined, planar, rough and smooth. Occasional black angular to subangular flint. CIRIA Grade [WHITE CHALK SUBGROUP] 63 AZCL between 41.60 and 42.20 m. Core 41 66 - 41 92 CS dropped and recovered in next core. Next pore overlaps. Core loss picked up from 100 41.1m in next core run from 41.10m. Drilling disturbed fracture, some wash out 42 and localised putty chalk between at 41.80 SPT 42.20 N=50 (6,11/50 for 150mm) 42.60 - 44.20 NI - SPT disturbed between 42.60 and 43.01 SPT N=50 (3,6/50 for 42.60 260mm) 43 NI between 43.10 and 43.25 m. Flint at 43.10 94 Planar fracture DI at 43.40 m. Planar fracture open 5mm no infill possibly DI at 43.50 m. 44 NI between 44.10 and 44.20 m. Recovered 44.20 - 45.70 as angular medium to coarse chalk gravel. 44.20 N=50 (5,7/50 for NI between 44.20 and 44.73 m. SPT 250mm) disturbed. SPT test channel filled with greyish brown fine sand. 100 Sub horizontal fracture set 100 mm apart infilled with fine to coarse angular chalk gravel between 44.85 and 44.95 m. 45.00 FW 45 Hole Diameter Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (m) Depth Said (m) Flush Type Flush Colo # Min (%) Max (%) 9.50 42.20 Polymer

# Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 6.00 m to 10.20 m and from 17.00 to 19.00 m.5. Rotary follow on from 10.20 m.6. Single install with 50 mm pipe. Response zone from 42.00 m to 47.00 m.7.
 Hole grouted above response zone to 0.30 m and grout left to oure before installing headworks.

# Deep Borehole Log Project Name: Meridian Water HIF and Date: 12/07/2021 - 30/07/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535463.95 N191543.03 Drilling Equipment: Dando 2000 | Hand Tools Project No.: GTS-19-250 Crew Name: RF+CB JCB 3CX | Commachio 405 Borehole Number Hole Type Level Page Number Logged By GI DZ2 BH2087 CP+RC 11.31m AOD AM / DW / ND 1:25 Sheet 10 of 10 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) RQD Depth (m) Type Results TOR SCR Weak, medium density very pale greyish white CHALK. Fractures are closely to medium spaced, clean and infilled with fine sand and very pale greyish white silt, tight, horizontal to inclined, planar, rough and smooth. Occasional black angular to subangular flint. CIRIA Grade [WHITE CHALK SUBGROUP] Planar fracture open 3mm infilled with chalk 45.70 - 47.10 silt at 45.05 m. 45.70 SPT N=50 (5,10/50 for NI at 45.15m. Core indented, probable loss due to fint strip/core wash. Sub horizontal clean fractures at 44.35, 45.45 and 45.55, open 3mm. Coarse flint 46 below fracture at 45.35 m AZCL between 45.70 and 46.12 m. SPT disturbed. NI between 46.12 and 46.30 m. SPT 79 disturbed below test, putty chalk. Planar fracture, drilling disturbed at 46.40 m. Open 6mm infilled with fine to coarse fling gravel with some silt. Planar fracture, open 2-3mm clean at 46.73 Planar fracture at 46.94 m. Drilling disturbed, open 5mm core wash around margins. 47.10 Softened. (-29.54)End of Borehole at 47,10m 48 49

# Remarks

Depth Base

Hole Diameter

Diameter

Casing Diameter

Diameter

Depth Base

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Concrete obstruction found - obstructions removed to 2.00 using JCB.
 Hole backfilled with arisings.
 Hole commenced using cabe percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 2.00 m to 3.50 m, from 8.00 m to 10.20 m and from 17.00 to 19.00 m.
 Rotary follow on from 10.20 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Chiselling

Tool

41.10

50

r Min (%) Max (%)

Drilling Flush

Depth Yop (m) Depth Seie (m) Flush Type Flush Colo

Polymer

47.10



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 9.5 - 11 2087 11 - 12.2





2087 12.2 - 13.9 2087 14.3 - 15.8



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 15.8 - 17.3 2087 17.3 - 18.5





2087 18.8 - 20.3 2087 20.3 - 21.5



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 21.5 - 23 2087 23 - 24.5





2087 24.3 - 25.8 2087 26.7 - 28.2



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 28.2 - 30.2 2087 30.2 - 31.7





2087 31.7 - 33.2 2087 33.2 - 34.7



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 34.7 - 36.2 2087 36.2 - 37.7





2087 37.7 - 39.2 2087 39.2 - 40.7



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250





2087 40.7 - 42.2 2087 41.1 - 42.6





2087 42.6 - 44.2 2087 44.2 - 45.7



Photograp	hic Report
-----------	------------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2087

Project ID:

GTS-19-250



2087 45.7 - 47.1

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 14/06/2021 - 30/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Logged By Page Number Scale GI\_DZ2\_BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 1 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type Brown very gravelly SAND. Sand is fine to coarse Gravel is subangular to subrounded fine to coarse brick, concrete, and flint. [MADE GROUND] 0.50 - 0.60ES 0.50 - 0.90В 0.95 D 1.00 - 1.10 ES 1.30 D 1.50 - 1.95 1.50 - 2.00 D SPT N=10 (6,9/5,1,2,2) 2.00 D 2.10 - 2.20 ES 2.10 Firm dark grey slightly silty CLAY. Hydrocarbon 2.10 - 2.28 (11.01)B [ALLUVIUM] D 2.35 2.50 - 2.95 UT HVP (kPA) =9 2.50 2.95 - 3.15 UT 2.95 PID PID = 1 ppm 3.20 - 3.30ES 3.50 - 3.95 3.50 - 4.00 3.50 Medium dense dark grey to black SAND and (8.91)GRAVEL. Sand is fine to coarse. Gravel is 3.50 N=13 (1,1/2,3,3,5) subangular to subrounded medium and coarse flint. Hydrocarbon odour. [KEMPTON PARK GRAVEL FORMATION] 4.20 - 4.30ES 4.20 PID PID = 29 ppm 4.40 D 4.50 - 5.00 В 4.50 N=20 (2,3/4,3,5,8) 5 Hole Diameter Casing Diameter Chiselling Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth You (in) Depth Seise (m) Flush Type Flush Colour Min (%) Max (%)

# Remarks

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole commenced using cable percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m.
 Rotary follow on from 9.30 m.
 Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Date: 14/06/2021 - 30/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Limited Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ2\_BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 2 of 9 Sample and In Situ Testing Coring Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Results TOR SCR RQD Type Medium dense dark grey to black SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded medium and coarse 5 20 - 5 30 ES flint, Hydrocarbon odour. 5.20 PID PID = 41 ppm [KEMPTON PARK GRAVEL FORMATION] 5.40 D 5.50 - 6.00 5.50 **cSPT** N=15 (1,2/3,3,4,5) 6 6.20 - 6.30 ES 6.40 D 6.50 - 7.00В 6.50 cSPT N=13 (2,3/3,3,3,4) 6.80 PID PID = 0 ppm 7.20 - 7.30ES 7.20 PID PID = 0 ppm D 7.40 7.50 - 8.00 B cSPT N=15 (2,3/3,4,3,5) 7.50 8.20 - 8.30 Firm to stiff dark grey laminated CLAY. 8.20 PID PID = 3 ppm (7.51)Laminations are extremely closely spaced and 8.30 D thin silt. Frequent pyritic nodules throughout 8.50 - 8.95 UT (up to 22 mm) [LONDON CLAY FORMATION] 8,50 HVP (kPA) =31 B 8.95 - 9.15 9 9.15 - 9.30 PID = 0 ppm 9.20 PID 9.70 - 10.95 C

# Hole Diameter Casing Diameter Chiselling Diameter Chiselling Dorph Base Diameter Depth Base Diameter Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Section Depth Section Diameter Diameter Diameter Diameter Depth Top Depth Base Duration Tool Depth Section Depth Section Depth Section Depth Section Diameter Diameter Diameter Diameter Diameter Diameter Diameter Diameter Diameter Depth Top Depth Base Duration Tool Depth Section Diameter D

10

# Remarks

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m. 4. Rotary follow on from 9.30 m. 5. Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m. 6. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	Hole CP and In Type	L	11.C	me: RF Level 01m AC Corin	/ MH+	A Legend	ged By B / ND Depth (Level)	Firm Lami thin s	Co-ords: E5 Drilling Equi   Commachi Sca 1:2 Stra to stiff dark gi inations are e: silt. Frequent to 22 mm). NDON CLAY F	priment. o 405 ale 25 tum Des	scription	Page Sheet	Numb et 3 of	er
Depth (m)  0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	CP and In Type D C SPT	e Type +RC Situ Testing Results	11.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Level Onm AC Corin	DD g	Log A Legend	B / ND Depth	Firm Lami thin s	Straft to stiff dark ginations are estit. Frequent to 22 mm).	tum Des rey lami extremely pyritic r	scription nated C v closely nodules	Page Sheet	Numb	er 9
Sample a Depth (m)  0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	CP and In Type D C SPT	+RC Situ Testing Results	11.C	Corin	g	A Legend	B / ND Depth	thin s (up to	Strainto stiff dark grinations are essitt. Frequent to 22 mm).	ale 25 tum Des rey lami xtremely pyritic r	nated C closely nodules	Shee	et 3 of	9
Sample a Depth (m)  0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	Type  D C SPT	Situ Testing Results	80 9,9)	Corin	g	Legend	Depth	thin s (up to	Strainto stiff dark grinations are exist. Frequent to 22 mm).	tum Des rey lami xtremely pyritic r	nated C closely nodules	CLAY.	and	
0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	Type D C SPT	Results	9,9)	SCR	-			thin s (up to	to stiff dark gr inations are ex silt. Frequent to 22 mm).	rey lami xtremely pyritic r	nated C closely nodules	CLAY. y spaced		11
0.95 - 11.40 0.95 - 12.45 10.95 1.28 - 11.45	D C SPT	N=31 (2,4/5,8,1	9,9)					thin s (up to	inations are ex silt. Frequent to 22 mm).	xtremely pyritic r	closely nodules	y spaced		11
0.95 - 12.45 10.95 1.28 - 11.45	C SPT	N=31 (2,4/5,8,9												1
														1:
2.45 - 13.95 12.45	D C SPT	N=33 (3,4/7,8,6	9,9)											1:
3.70 - 13.95 3.95 - 14.28	cs		93											
3.95 - 15.40 13.95	SPT	N=50 (5,9/50 180mm)	2000			XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX	14.25 (2.78)	thin. [HAR	inations are ex	xtremely	closely	y spaced		14
neter Depti	h Base	Diameter	Depth Top	Depti		Duration	Tool		Depth Yop (m) Depth Sa	eie imiFlust	1 Type flu	sh Colour N	tin (%) 1	Max
3.	95 - 14.28 95 - 15.40 13.95	95 - 14.28 D 95 - 15.40 C 13.95 SPT	95 - 14.28 D 95 - 15.40 C 13.95 SPT N=50 (5,9/50 180mm)	70 - 13.95 CS  95 - 14.28 D 95 - 15.40 C 13.95 SPT N=50 (5,9/50 for 180mm)  69	95 - 14.28 95 - 15.40 13.95 SPT N=50 (5,9/50 for 180mm) 69	70 - 13.95 CS 95 - 14.28 D 95 - 15.40 C 13.95 SPT N=50 (5,9/50 for 180mm) 69	70 - 13.95 CS  95 - 14.28 DC SPT N=50 (5,9/50 for 180mm)  69	70 - 13.95 CS  95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  14.25	70 - 13.95 CS  95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  69  Casing Diameter  Chiselling  Chiselling	70 - 13.95 CS  95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  69  Casing Diameter  Casing Diameter	70 - 13.95 CS 95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  69  Casing Diameter  Chiselling	70 - 13.95 CS  95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  14.25	70 - 13.95 CS  95 - 14.28 D C SPT N=50 (5.9/50 for 180mm)  14.25	70 - 13.95 CS 95 - 14.28 D C SPT N=50 (5,9/50 for 180mm)  69  Casing Diameter Chiselling Drilling Flush

### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/06/2021 - 30/06/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Scale Hole Type Level Logged By Page Number GI DZ2 BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 4 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) TOR SCR RQD Depth (m) Type Results Dark grey slightly clayey laminated SILT. Laminations are extremely closely spaced and [HARWICH FORMATION - SWANSCOMBE 15.35 15.40 - 15.85 from 15.24 to 15.31 m with frequent white (-3.24)15.40 - 17.00 bivalve fossils 15.40 SPT N=35 Firm light greenish grey slightly sandy silty (2,4/6,9,10,10) CLAY, quickly becoming stiff greenish grey 15.60 - 15.70 ES mottlec reddish brown CLAY. Thin band (50 15.60 PID PID = 0 ppmmm) of black rounded flint gravel at the top. [LAMBETH GROUP - UPPER MOTTLED CLAY 16 109 16.60 - 16.90 CS 17.00 - 17.45 17.00 D Very stff fissured grey mottled reddish and 17.00 - 17.75 C (-4.34)orangish brown CLAY. Fissures 0-90 degrees, 17.00 SPT N = 43extremely to very closely spaced planar to (4,7/7.10,13,13) undulating polished to smooth tight and clean. [LAMBETH GROUP - UPPER MOTTLED 100 CLAY 17.75 - 18.45 C blueish grey mottled orangish occasionally reddish brown at 17.75 m. 18 100 18.10 Very stff fissured grey mottled reddish and 18.15 - 18.36 CS (-5.99)orangish brown calcareous CLAY with frequent white concretions. Fissures 0-90 degrees, extremely to very closely spaced planar to undulating polished to smooth tight and clean. 18.45 - 18.63 D Possible mid Lambeth hiatus transition. 18.45 - 19.95 C ILAMBETH GROUP - UPPER MOTTLED 18.45 SPT N=50 (25 for CLAY] 105mm/50 for 75mm) 19 19.02 Extremely weak to very weak, medium strong (-7.09)between 19.06 and 19.11 m, white occasionally 19.20 - 19.35 CS 93 brown and blueish grey CALCRETE. Mid Lambeth hiatus [LAMBETH GROUP - MID LAMBETH HIATUS] Stiff brown mottled blueish grey occasionally orange sandy CLAY. Sand fine and medium. [LAMBETH GROUP - LOWER MOTTLED 19.90 19.95 - 20.27 D CLAY] (-8.01)20 19.95 - 21.40 C Casing Diameter **Drilling Flush** Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top (in) Depth Said (in) Flush Type Flush Colour Min (%) Max (%)

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m. 4. Rotary follow on from 9.30 m. 5. Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m. 6. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/06/2021 - 30/06/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ2\_BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 5 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) TOR SCR RQD Type Results 19.95 N=50 (4,9/50 for Stiff brown mottled blueish grey occasionally orange sandy CLAY. Sand fine and medium. 175mm) [LAMBETH GROUP - LOWER MOTTLED with dark greenish grey sand burrow infill 20.65 (<20 mm) from 20.55 m. 79 20.65 CS 20.65 CS 20.85 CS CS 20.65 Dark greenish grey silty glauconitic SAND with very closely spaced firm brown sandy clay (-8.89)20.65 burrowinfill (<20 mm). Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 20.65 20.65 - 20.85 21.05 - 21.20 CS ES 21.05 PID mottled burrow infill absent from 21.30 m. 21.40 - 21.63 21.40 - 21.80 D 21,40 SPT N=50 (5,18/50 for 80mm) light yellowish brown slightly clayey very gravelly bed (200 mm) from 21.60 m. Gravel 21.80 - 23.40 C angular to rounded fine to coarse flint. thickly laminated to thinly bedded brown to dark greenish grey with gravel beds and stiff dark grey clay laminae from 21.80 to 22.40 m. Gravel angular to rounded fine to coarse 81 22.75 Dark brownish grey silty SAND with extremely (-9.84)to very closely spaced stiff dark grey clay 22.90 - 23.10 burrow infill (<10 mm). Sand fine and medium. 22.90 PID PID = 0 ppm [LAMBETH GROUP - UPNOR FORMATION] 23 23.40 - 23.80 23.40 - 24.90 23.40 SPT N=50 (4,6/50 for sand burrow infill light grey from 23.50 m. 24 100 24.90 - 25.32 D 24.90 - 26.35 C 25 Hole Diameter Casing Diameter Drilling Flush Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Depth Top (in) Depth Base (in) Flush Type Flush Colour Min (%) Max (%)

# Remarks

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m. 4. Rotary follow on from 9.30 m. 5. Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m. 6. Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

### Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/06/2021 - 30/06/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI DZ2 BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 6 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) Depth (m) Type TOR SCR RQD Results 24.90 SPT N=50 (3,5/50 for Dark brownish grey silty SAND with extremely to very closely spaced stiff dark grey clay 270mm) burrowinfill (<10 mm). Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 25.00 25.00 25.00 EW with occasional white shell fragments from 25.00 25.10 to 25.70 m. 100 with rare shell fragments from 25.70 m. 25.95 Very stff thinly to thickly laminated dark 26 (-11.74)brownish grey CLAY with silty sand laminae. Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] 26.35 - 26.74 D 26.35 - 27.80 C 26.45 SPT Very dense dark brownish grey silty SAND with N=50 (4,8/50 for (-14.94)240mm) extremely to very closely spaced stiff dark grey clay and grey sand burrow infill (<10 mm). Sand fine and medium. [LAMBETH GROUP - UPNOR FORMATION] thinly interlaminated with very stiff clay from 27 26.88 to 26.96 m. 72 very stiff thinly laminated clay with sand laminae from 27.15 to 27.33 m. gravelly from 27.33 to 27.35 m. Gravel is rounded medium flint. AZCL from 27.35 to 28.00 m 27.80 - 28.17 D 27.80 - 29.30 C N=50 (3,6/50 for 27.80 SPT 225mm) recovered as rounded medium to coarse flint 28.13 EW gravel between 28.00 and 28.20 m. 83 gravelly from 28.77 to 29.10 m. Gravel rounded fine to coarse flint. 29 sandy gravel bed between 29.10 and 29.17 m. Gravel is rounded medium and coarse 29.30 - 29.56 29.30 - 30.80 D SPT 29.30 N=50 (4,10/50 for 29.50 gravelly from 29.45 to 29.50 m. Gravel 110mm) (-15.44) rounded fine and medium flint. Very dense dark grey silty SAND with extremely 29.70 - 29.90 ES to closely spaced black sandy silt partings and pockets (<10 mm). Sand fine and medium. [THANET SAND FORMATION] PID 29.70 PID = 0 ppm 30

# Remarks

Depth Base

Hole Diameter

Diameter

Casing Diameter

Diameter

Depth Base

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole commenced using cable percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m.
 Rotary follow on from 9.30 m.
 Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Chisel

Tool

Drilling Flush

epth Top (in) Depth Said (in) Flush Type Flush Colour Min (%) Max (%)

Water			: Meridian Ground Ir			1	Client: London Borough of Enfield  Contractor: Ground Technology Services							4/06/20	21 - 30/	06/2021		
Clear Nation   Commachio 405	ati	on: Mer	idian Wate	er, Er	nfield			r: Grou	ind le	chnology	Services	•						
Depth   Hole Type   Level   Logged By   Scale   Page Number   Sheet 7 of 9	jec	t No. : (	STS-19-2	50			La proportional de la companya della companya della companya de la companya della						Drilling Equipment: Hand Tools   Dando 2   Commachio 405					
Strikes													Scale Page N					
Depth (m)   Type   Results   ToR   SoR   Roo   Leven   Vary dense dark grey silty SAND with extremely to closely spaced black sandy sit partings and pockets (20 mm) of grey fine to coarse sand at 31.10 m.   SoR   Roo   Vary dense dark grey silty SAND with extremely to closely spaced black sandy sit partings and pocket (20 mm) of grey fine to coarse sand at 31.10 m.   SoR   Roo   Roo   Vary dense dark grey silty SAND with extremely to closely spaced black sandy sit partings and pocket (20 mm) of grey fine to coarse sand at 31.10 m.   SoR   Roo	1		Sam	ple a	nd In	Situ Testing		Coring		Legend				Stratum	Descript	tion		
30.80 - 30.97 D 30.80 - 30.97 D 30.80 - 32.40 SPT N=53 (25 for 95mm)50 for 80mm)  32.40 - 32.60 D 32.40 SPT 110mm/50 for 110mm/50 for 95mm/50 for 110mm/50 for 11		Strikes	Depth (r	n)	Туре	Results	TCR	SCR	RQD	V. X - 17	(Level)	Van	donco		00		wtromoly	+
30.80 - 32.40   SPT   N=5) (25 for 95mm/50 for 80mm)   94			527(870) 1702	242,324			90					to cl	osely spacets (<10	mm), Sa	ck sandy and fine a	silt partir nd medi	ngs and	
94  32.40 - 32.60 D 32.40 - 34.00 C 32.40 SPT  N=53 (25 for 110 mm) S0 for 90 mm)  94  34.00 - 34.24 34.00 - 35.40 SPT  N=53 (25 for 130 mm) S0 for 110 mm) N=53 (25 for 130 mm)										××××								
32.40 - 32.60 D 32.40 SPT N=53 (25 for 110nm/50 for 90mm)  94  34.00 - 34.24 D C SPT N=53 (25 for 130nm/50 for 110mm)  104  N=53 (25 for 130nm/50 for 110mm)  104			30.80	8	SPT	95mm/50 fc								ım) of gı	rey fine t	o coars	e sand	3
32.40 - 34.00 SPT N=53 (25 for 110mm/50 for 90mm)  94  34.00 - 34.24 34.00 SPT N=53 (25 for 130mm/50 for 110mm)  N=53 (25 for 110mm/50 for 110mm)  104  Hole Diameter Casing Diameter Chiselling Drilling Flush							94											
34.00 - 35.40   C   SPT   N=50 (25 for 130mm/50 for 110mm)			32.40 - 34	1.00	C	110mm/50 f	or											4 2
Hole Diameter Casing Diameter Chiselling Drilling Flush			34.00 - 35	5.40	C					X X X								3
										seuthick()()								3
	_			Depth			Depth Top	Depth			Too	k	Depth Yop (m)	Depth Sale In			Min (%)	Ma
			0200000			10000000			1337512							1		
	าล	arks														L		_

# Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/06/2021 - 30/06/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ2\_BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 8 of 9 Sample and In Situ Testing Corina Water Depth Well Stratum Description Legend Strikes (Level) Depth (m) Results TOR SCR RQD Type Very dense dark grey silty SAND with extremely to closely spaced black sandy silt partings and pockets (<10 mm). Sand fine and medium. [THANET SAND FORMATION] 35.40 - 35.65 D 35.40 - 37.00 35.40 SPT N=50 (B, 17/50 for 75mm) 36 100 37.00 - 37.28 37.00 - 38.40 D 37 C 37.00 SPT N=50 (7,11/50 for 130mm) 107 sandy gravel bed between 37.85 and 37.95 37.95 m. Gravel angular to sub rounded medium to 38.05 - 38.40 CS coarse flint. Bullhead Beds. Very weak medium density white with light grey burrowing mottling CHALK, fractures medium spaced and clean unstained. CIRIA Grade 38.40 - 38.55 [WHITE CHALK SUBGROUP] 38.40 - 39.90 AZCL from 38.40 to 39.00 38.40 SPT N=53 (25 for 120mm/50 for 35mm) 39.00 - 39.20 ES 39 39.00 PID PID = 0 ppmgravelly from 39.20 to 39.25 m. Gravel is sub angular medium and coarse flint. 39.56 - 39.90 CS gravelly from 39.66 to 39.70 m. Gravel sub angular medium and coarse flint. 39.90 - 40.35 D 39.90 - 41.50 C 40 **Drilling Flush** Hole Diameter Casing Diameter Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Depth Top (in) Depth Said (in) Flush Type Flush Colour Min (%) Max (%) CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole commenced using cable percussive techniques into the top of the London Clay Formation. 3. Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m. 4. Rotary follow on from 9.30 m. 5. Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m. 6. Hole grouted above response zone to

0.30 m and grout left to cure before installing headworks.

## Deep Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 14/06/2021 - 30/06/2021 Infrastructure Ground Investigation Contractor: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535443.82 N191626.86 Drilling Equipment: Hand Tools | Dando 2000 Project No.: GTS-19-250 Crew Name: RF / MH+RF+MH Commachio 405 Borehole Number Hole Type Level Logged By Page Number Scale GI\_DZ2\_BH2009 CP+RC 11.01m AOD AB / ND 1:25 Sheet 9 of 9 Sample and In Situ Testing Corina Water Depth Well Legend Stratum Description Strikes (Level) RQD Depth (m) Results TOR SCR Type 39.90 N=84 Very weak medium density white with light grey (6,8/9.15,25,35) burrowng mottling CHALK, fractures medium spaced and clean unstained. CIRIA Grade [WHITE CHALK SUBGROUP] black sub angular coarse flint from 40.55 to 40.62 m. 91 41.00 EW 41.00 EW 41.00 EW 41.10 - 41.40 CS black sponge bed between 41.18 and 41.20 41.50 - 41.94 D 41.50 - 43.00 C 41.50 SPT N=100 (4,6/100 for 290mm) 42 42.10 - 42.30 CS heavy turrowing mottling between 42.10 and 42.20 m 100 black sub angular coarse flint from 42.44 to 42.52 m. shell fragment at 42.91 m. 43.00 - 43.43 43.00 - 44.00 43 N=110 (6,9/110 for 43.00 SPT 285mm) gravelly between 43.44 and 43.50 m. Gravel 110 is rounded fine and medium flint. 43.67 - 43.77 CS 44.00 - 44.44 44.00 SPT N=52 (25 for 145mm/52 for 250mm) End of Borehole at 44,44m -26.94)45

# Remarks

Depth Base

Hole Diameter

Diameter

Casing Diameter

Diameter

Depth Base

CAT Scan performed and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole commenced using cable percussive techniques into the top of the London Clay Formation.
 Environmental seals installed from 1.50 to 3.50 m, from 7.30 m to 9.30 m and from 19.40 to 21.40 m.
 Rotary follow on from 9.30 m.
 Single install with 50 mm pipe. Response zone from 35.00 m to 40.00 m.
 Hole grouted above response zone to 0.30 m and grout left to cure before installing headworks.

Depth Top Depth Base Duration

Chiselling

Tool

**Drilling Flush** 

Min (%) Max (%)

ie in Flush Type Flush Co

Polymer

44.00



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

Project ID:

GTS-19-250





2009 9.4 - 10.95 2009 12.45 - 13.95





2009 13.95 - 15.40 2009 15.40 - 17.00



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

Project ID:

GTS-19-250





2009 17.00 - 18.45 2009 18.45 - 19.95





2009 19.95 - 21.40 2009 21.40 - 23.40



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

Project ID:

GTS-19-250





2009 23:40 - 24:90 2009 24:90 - 26:35





2009 26 35 - 27.80 2009 27.80 - 29.30



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

Project ID:

GTS-19-250





2009 29:30 - 30:80 2009 30:80 - 32:40





2009 32.40 - 34.00 2009 34.00 - 35.40



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

Project ID:

GTS-19-250





2009 35.40 - 37.00 2009 37 - 38.4





2009 38.4 - 39.9 2009 39.9 - 41.5



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ2\_BH2009

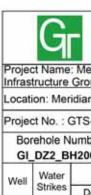
Project ID:

GTS-19-250





2009 41.5 - 43 2009 43 - 4



# Shallow Borehole Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.85 N191830.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ2\_BH2008 CP 10.06m AOD AM / DW 1:25 Sheet 1 of 6 Sample and In Situ Testing Depth Stratum Description Legend (m) (m) Results Depth (m) Type Asphalt / Hard standing. [MADE GROUND] 10.06 0.12 Greyish brown, very gravelly, fine to coarse sand. Gravel is angular to rounded, fine to coarse, coal ash, 0.30 ES brick, concrete, flint, quartzite, tile and glass. 0.30 - 0.80В [MADE GROUND] 0.30 PID PID = 0 ppm 0.50 ES 0.50 PID PID = 0 ppm0.80 9.94 Soft to firm, greenish grey, slightly sandy, slightly gravelly clay. Gravel is angular to subrounded, flint and brick. Slight organic odour. 1.00 ES IMADE GROUNDI 1.00 - 1.50 1.00 PID PID = 0 ppm 1.50 - 1.95 UT 1.50 9.26 Firm fissured, brown mottled grey CLAY. Fissures are randomly oriented, undulating and smooth. Frequent decaying rootlets. Frequent iron oxide staining. [ALLUVIUM] 1.95 - 2.15 D 2 2.20 ES 2.20 PID PID = 0 ppm 2.50 D 2.50 - 3.00 B 2.50 SPT N=9 (1,2/2,2,2,3) 2.70 8.56 Firm, dark greyish brown, peaty silty CLAY. Frequent buried / decaying rootlets. Slight organic odour. Occasional shell fragments. [ALLUVIUM] 3.10 ES 3.10 PID PID = 0 ppm3.25 D 3.50 EW 3.50 7.36 Medium dense multicoloured, very sandy GRAVEL. 3.50 EW Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse, 3.50 - 4.00 3.50 CSPT N=12 (3,2/2,3,4,3) [KEMPTON PARK GRAVEL FORMATION] 4.00 EW 4.10 ES 4.10 PID PID = 0 ppm4.25 D 4.42 EW 4.50 EW 4.50 EW 4.50 - 5.00 B 4.50 CSPT N=21 (3,3/4,4,7,6) 5.00 EW 5 Inclination and Orientation Hole Diameter Casing Diameter Chisel Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.50 m to 2.50 m and from 6.50 to 7.50 m.
 Dual install with 50 mm pipe.
 Response zones from 3.50 m to 6.25 m and from 18.50 m to 20.50 m.

# Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E535495.85 N191830.41 Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ2\_BH2008 CP 10.06m AOD AM / DW 1:25 Sheet 2 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 5.00 EW Medium dense multicoloured, very sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 5.25 D [KEMPTON PARK GRAVEL FORMATION] 5.50 - 6.00 5.50 **cSPT** N=18 (3,3/4,5,4,5) 6 6.35 D 6.35 6.56 Stiff, fissured, slightly sandy, micaceous CLAY. 6.35 - 6.50 D Fissures are 5-10 degrees planar and smooth. Rare 6.50 - 6.95 pyritized nodules (<50mm). Rare light grey fine sand / silt partings (<1mm). [LONDON CLAY FORMATION] 6.95 - 7.25 D 7.20 ES 7.20 PID PID = 0 ppm 7.25 D 7.50 D 7.50 - 8.00 7.50 SPT N=21 (2,2/3,4,7,7) 8.25 D 8.50 - 8.95 UT 8.95 - 9.15 D 9 9.25 D 9.50 D 9.50 - 10.00 В SPT 9.50 N=30 (3,5/6,7,7,10)

# Hole Diameter Casing Diameter Chiselling Inclination and Orientation Depth Base Diameter Depth Base Diameter Depth Base Duration Tool Depth Top Depth Base Inclination Orientation 7.50 250 7.50 250

10

# Remarks

10.00

EW

1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using cable percussive techniques into the Lambeth Group. 3. Environmental seals installed from 1,50 m to 2,50 m and from 6,50 to 7,50 m, 4. Dual install with 50 mm pipe. Response zones from 3,50 m to 6,25 m and from 18,50 m to 20,50 m.

### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.85 N191830.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ2\_BH2008 1:25 CP 10.06m AOD AM / DW Sheet 3 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Stiff, fissured, slightly sandy, micaceous CLAY. 10.00 EW Fissures are 5-10 degrees planar and smooth. Rare pyritized nodules (<50mm). Rare light grey fine sand / 10.23 EW silt partings (<1mm). 10.23 EW [LONDON CLAY FORMATION] 10.25 D 10.50 EW 10.50 - 10.95 10.80 3.71 Stiff dark grey mottled greenish grey sandy CLAY with frequent sand <20mm pockets. Sand is fine and 10.95 - 11.15 D medium. 11 **IHARWICH FORMATION - SWANSCOMBE** MEMBERI 11.35 D 11.50 - 12.00 N=50 (10,15/50 11.50 for 150mm) 12 clayey sand from 12.00 to 12.50 m. 12.25 D 12.50 - 13.00 B 12.50 -0.74Stiff fissured blueish grey mottled reddish brown and N=50 (25 for 12.50 SPT brown CLAY. Fissures randomly oriented extremely 100mm/50 for closely spaced planar and undulating polished to 250mm) smooth tight and clean. Rare fine sand veins [LAMBETH GROUP - UPPER MOTTLED CLAY] 13 13.25 D 13.30 - 13.40 ES 13.30 PID PID = 0 ppm 13.50 - 13.95 UT 13.95 - 14.15 D 14

Hole Diameter Casing Diameter Chiselling Inclination and Orientation

Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top Depth Base Inclination Orientation

very stiff from 14.00 m.

15

# Remarks

14.25

14.50 - 14.95

14.50 - 15.00

14.50

D

D

B

N=40 (6,6/6,9,11,14)

1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using cable percussive techniques into the Lambeth Group. 3. Environmental seals installed from 1,50 m to 2,50 m and from 6,50 to 7,50 m, 4. Dual install with 50 mm pipe. Response zones from 3,50 m to 6,25 m and from 18,50 m to 20,50 m.

### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.85 N191830.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By 1:25 GI\_DZ2\_BH2008 CP 10.06m AOD AM / DW Sheet 4 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Stiff fissured blueish grey mottled reddish brown and brown CLAY. Fissures randomly oriented extremely closely spaced planar and undulating polished to 15.25 D smooth tight and clean. Rare fine sand veins [LAMBETH GROUP - UPPER MOTTLED CLAY] 15.50 - 15.95 UT mottled reddish and orangish brown slightly sandy from 15.50 m. Sand is fine. 15.95 - 16.15 D 16 16.25 D 16.50 - 16.85 16.50 - 17.00 D В 16.50 SPT N=50 (B,12/50 for 200mm) 17 17.25 D calcareous from 17.25 m. 17.50 - 17.75 17.50 - 18.00 D B 17.50 SPT N=50 (25 for 125mm/50 for 125mm) 18 00 18 18.00 EW 18.25 D 18.35 -2.44Very stiff grey mottled yellowish brown sandy slightly gravelly CLAY Sand fine and medium. Gravel angular 18.50 - 18.70 and subangular fine and medium white flint. 18.50 - 19.00 [LAMBETH GROUP - LOWER MOTTLED CLAY] 18.50 SPT N=50 (25 for 100mm/50 for 100mm) 19 19.25 - 19.35 D 19.50 - 19.70 D 19.50 - 20.00 В N=50 (25 for 10mm/50 for SPT 19.50 slightly sandy. Gravel absent between 19.70 and 100mm) 20.35 m 20 Inclination and Orientation Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

# Remarks

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.50 m to 2.50 m and from 6.50 to 7.50 m.
 Dual install with 50 mm pipe.
 Response zones from 3.50 m to 6.25 m and from 18.50 m to 20.50 m.

### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.85 N191830.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Scale Page Number Logged By GI\_DZ2\_BH2008 1:25 CP 10.06m AOD AM / DW Sheet 5 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Very stiff grey mottled yellowish brown sandy slightly gravelly CLAY Sand fine and medium. Gravel angular and subangular fine and medium white flint. 20.25 D [LAMBETH GROUP - LOWER MOTTLED CLAY] 20.35 - 20.45 EŞ 20.35 PID PID = 0 ppm 20.45 -8.2920.50 - 21.00 20.50 Dense, locally very dense dark brownish grey silty В SAND with stiff dark grey clay and grey sand burrow SPT N=47 infill (< 10 mm). Sand is fine and medium. (2,2/3 10,14,20) [LAMBETH GROUP - UPNOR FORMATION] from 20.50 to 21.00 recovered as sandy clayey gravel. Gravel is rounded medium and coarse black flint. 21 21.25 D 21.50 - 21.95 21.50 - 22.00 D В 21.50 SPT N=50 (7,14/10,9,14,17) 22 22.25 D 22.50 - 22.95 UT 22.95 - 23.15 D 23 23.25 D 23.50 - 23.95 23.50 - 24.00 В 23.50 SPT N=44 (7,10/9,11,11,13) 24 24.25 D 24.30 - 25.00 B 24.50 - 24.75 24.50 - 25.00 D very dense from 24.50 m. Between 24.50 and B 24.75 m, interlaminated with very stiff dark SPT N=50 (25 for 24.50 brownish grey clay. 125mm/50 for 125mm) 25 Inclination and Orientation

Depth Base

Hole Diameter

Diameter

Casing Diameter

Diameter

Depth Base

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using cable percussive techniques into the Lambeth Group.
 Environmental seals installed from 1.50 m to 2.50 m and from 6.50 to 7.50 m.
 Dual install with 50 mm pipe.
 Response zones from 3.50 m to 6.25 m and from 18.50 m to 20.50 m.

Chisel

Tool

Depth Top | Depth Base | Inclination

Orientation

Depth Top Depth Base Duration

# Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 16/07/2021 - 25/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535495.85 N191830.41 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: RF Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number 10.06m AOD AM / DW GI\_DZ2\_BH2008 CP 1:25 Sheet 6 of 6 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Dense, locally very dense dark brownish grey silty SAND with stiff dark grey clay and grey sand burrow infill (< 10 mm). Sand is fine and medium. 25.25 D [LAMBETH GROUP - UPNOR FORMATION] 25.50 - 25.70 D band of (200 mm) laminated very stiff dark 25.50 SPT N=50 (25 for brownish grey clay interbedded with sandy gravel 100mm/50 for 25.70 -10.39between 25.50 and 25.70 m. Gravel is rounded fine 100mm) and medium fint. End of Borehole at 25.70m 26 27 28 29 30 Hole Diameter Chiselling Inclination and Orientation Casing Diameter Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

# Remarks

1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using cable percussive techniques into the Lambeth Group. 3. Environmental seals installed from 1,50 m to 2,50 m and from 6,50 to 7,50 m, 4. Dual install with 50 mm pipe. Response zones from 3,50 m to 6,25 m and from 18,50 m to 20,50 m.

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 23/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536145.19 N191869.20 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number TP 9.93m AOD GI\_DZ7\_TP2059 ND 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 9.93 Reinforced CONCRETE. [MADE GROUND] 0.35 9.58 Light orangish brown sandy GRAVEL. Sand fine to 0.40 9.53 coarse. Gravel angular to rounded fine to coarse flint. [MADE GROUND] Firm greyish brown sandy slightly organic CLAY with 0.60 - 0.70В brown silt partings and white root traces and shell 0.60 - 0.70D fragments. Frequent <100mm lenses of black 0.70 ES amorphous peat and greyish brown sandy gravel. 0.70 PID PID=0.60 Sand fine to medium. Gravel subrounded to well rounded fine to coarse flint. [ALLUVIUM] 1.90 - 2.00 1.90 - 2.00 2.00 2.00 В D 2 PID PID=0.20 interbedded clay and gravel with peat lenses between 2.70 and 3.10 m. 3.00 - 3.10 3.00 - 3.10 3 D 3.10 3.10 ES End of Trial Pit at 3.10m 3.10 PID PID=0.40 4 Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Shoring Used Date Rate Pit Length (m) Pit Width (m) Orientation (deg) Remarks Remarks 2.50 0.60 Stable Not required Groundwater struck at 2.70 m. Inflow very slight. Weather Remarks 1. Position scanned using a CAT prior to digging, 2. Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2059

Project ID:

GTS-19-250





1. Saw cut and pit

2. Excavation side and base





## Trial Pit Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 22/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535846.72 N191982.66 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.78m AOD 1:20 GI\_DZ7\_TP2060 TP ND Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Results Depth (m) Type 10.78 Mass CONCRETE. [MADE GROUND] 0.23 10.55 Dark brown to black sandy clayey GRAVEL with low cobble content. Sand fine to coarse. Gravel angular to rounded fine to coarse clinker brick flint, Cobble angular concrete and brick.
[MADE GROUND] 0.50 - 0.60 0.50 - 0.60 В D 0.60 ES 0.60 PID PID=0.30 black from 0.70 to 0.90 m. 0.90 9.88 Firm varying to very stiff white to black mottled orange and red silty CLAY, [MADE GROUND] 1.00 - 1.10 В 1 1.00 - 1.10 D 9.68 1.10 1.10 ES Reddish brown silty SAND. Sand fine and medium. 1.10 PID PID=0.10 Saturated. 1.20 - 1.30 В [MADE GROUND] 1.20 - 1.30 D 9.48 1.30 Firm dark brownish grey slightly organic CLAY with silt 1.30 E\$ partings. Black root traces and rare white shell 1.30 PID PID=0.30 1.50 - 1.60 В [ALLUVIUM] 1.50 - 1.60 D 1.60 ES PID 1.60 PID=0.40 light brownish grey from 1.90 to 2.60 m. 2 2.50 - 2.60В 2.50 - 2.60 D 2.60 ES organic between 2.60 and 3.00 m. 2.60 PID PID=0.10 3.00 7.78 3 Dark brown clayey amorphous PEAT. [ALLUVIUM] 3.20 - 3.30 3.20 - 3.30 В D 3.30 3.30 ES End of Trial Pit at 3 30m 3.30 PID PID=0.40 4 Pumping Data Trench Support and Comment Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 Stable Not required No groundwater encountered. 0.60 Weather

1. Position scanned using a CAT prior to digging, 2, Surface concrete broken out by JCB, 3, Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2060

Project ID:

GTS-19-250

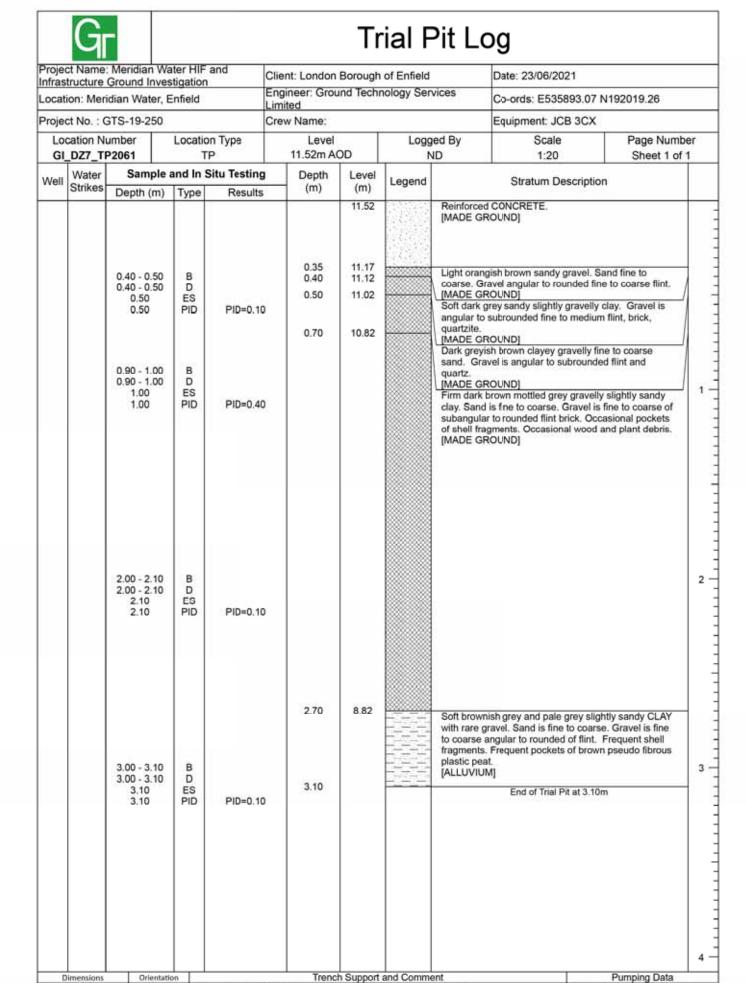




1. Complete excavation

2. Side and base





# Pit Length (m) Pit Width (m) Orientation (deg) Pit Stability Shoring Used Remarks Date Rate Remarks 0.00 2.50 Stable Not required No groundwater encountered.

#### Remarks

Position scanned using a CAT prior to digging.
 Surface concrete broken out by JCB.
 Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2061

Project ID:

GTS-19-250





1. Complete excavation

2. Sides and base





# Trial Pit Log

Date: 22/06/2021 Client: London Borough of Enfield Engineer: Ground Technology Services Co-ords: E535816.50 N191967.81 Limited Crew Name: Equipment: JCB 3CX Level Logged By Scale Page Number 10.74m AOD 1:20 ND Sheet 1 of 1 Sample and In Situ Testing Depth Level Legend Stratum Description (m) (m) 10.74 0.06 10.68 [MADE GROUND] 0.12 10.62 Light reddish grey sandy GRAVEL. Sand fine to coarse. Gravel angular and subangular fine to coarse microgranite? [MADE GROUND] 0.30 - 0.40 D Dark greyish brown sandy slightly clayey GRAVEL 0.40 ES with low cobble content. Sand fine to coarse. Gravel PID=0.30 0.40 PID 0.50 10.24 angular to subrounded fine to coarse clinker brick flint. Cobble angular brick. [MADE GROUND] Firm varying to very stiff white to black mottled orange 0.70 - 0.80 0.70 - 0.80 B and red silty CLAY with sandy gravel <200mm lenses. Sand and gravel as above. 0.80 ES [MADE GROUND] 0.80 PID PID=1.40 1 1.50 9.24 Firm dark brownish grey slightly organic CLAY with silt partings. Black root traces and rare white shell fragments. 1.70 - 1.80 В [ALLUVIUM] 1.70 - 1.80 D 1.80 ES 1.80 PID PID=27.40 2 2.30 - 2.40 В brownish grey mottled brown with black and white 2.30 - 2.40 D root traces between 2.30 and 3.00 m. ES 2.40 PID 2.40 PID=2.00 3.00 7.74 3 Dark brown clayey pseudo fibrous PEAT. [ALLUVIUM] 3.20 - 3.30 В 3.20 - 3.30D 3.30 3.30 ES End of Trial Pit at 3 30m 3.30 PID PID=1.40 4 Pumping Data Trench Support and Comment Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 Stable Not required Groundwater seepage, from 1,50 m. 0.60 Weather

1. Position scanned using a CAT prior to digging, 2. Surface tarmac broken out by JCB, 3, Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2062

Project ID:

GTS-19-250





1. Prior to excavation

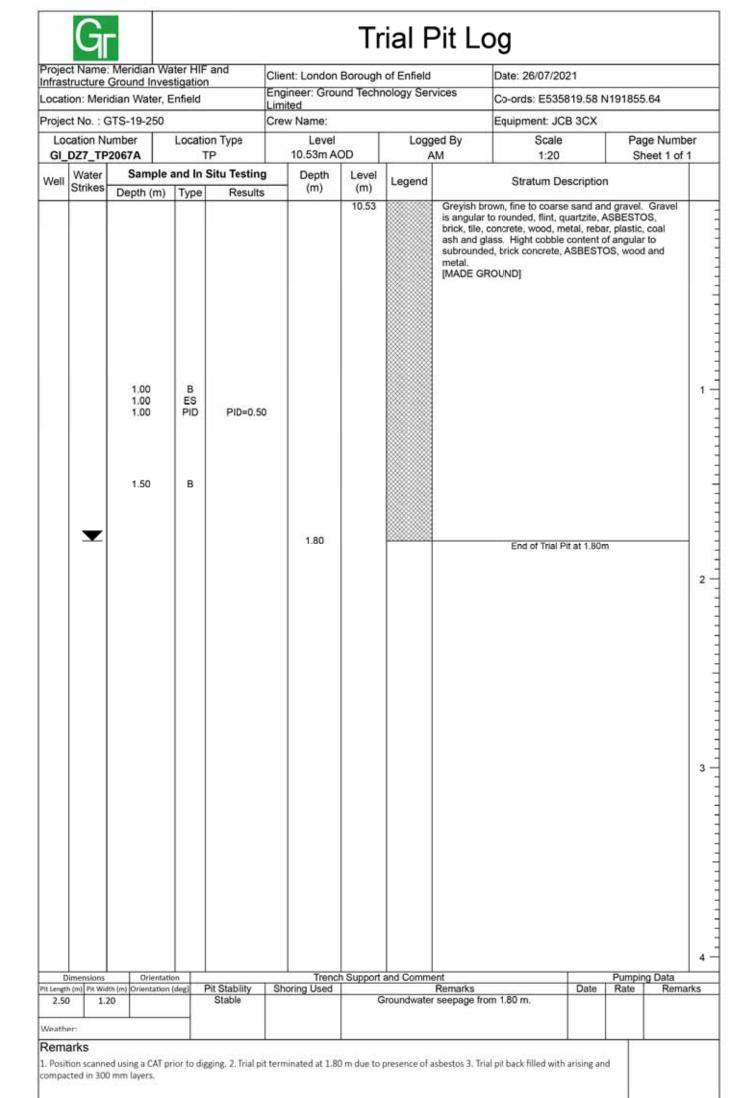
2. Complete excavation





3. Base and side

4. Spoil





Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2067A

Project ID:

GTS-19-250





1. Prior to excavation

2. Complete excavation



#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 26/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535825.17 N191858.14 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 1:20 GI\_DZ7\_TP2067B TP 10.40m AOD AM Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.40 Reinforced concrete with rebar. [MADE GROUND] 10.25 0.15 Blackish grey very sandy gravel. Gravel is angular to rounded fine to coarse flint, coal ash, brick, metal and concrete. Sand is fine to coarse. Occasional pockets of white putty material, possible ash deposit. 0.40 [MADE GROUND] 0.40 ES 0.40 PID PID=0.70 0.80 В 0.80 ES 0.80 PID PID=0.80 1.00 9.40 Firm, brown mottled dark grey and brown, slightly sandy, slightly gravelly clay. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick, concrete 1.20 В and metal. Sand is fine to coarse. 1.20 ES [MADE GROUND] 1.20 PID PID=1.00 frequent roots and rootlets (<20 mm) at 1.00 m. 1.50 8.90 Soft to firm, fissured, greenish grey CLAY. Fissures are randomly oriented, planar, smooth and polished. Occasional light grey fine sand / silt partings (<2mm). Slight organic odour. [ALLUVIUM] 1.80 В 1.80 ES 1.80 PID PID=1.60 2 frequent brown iron oxide staining from 2.30 m. frequent lenses of dark brown fibrous peat and 2.80 D peaty clay (<200 mm) between 2.70 and 3.10 m. 3 3.10 7.30 Multicoloured, sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse [KEMPTON PARK GRAVEL FORMATION] 3.50

Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Shoring Used Remarks Date Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 Stable Groundwater seepage from 1.00 m. Groundwater 0.80 struck at 3.20 m. Weather

End of Trial Pit at 3.50m

4

3.50

3.50

В

ES

PID

PID=1.00

1. Position relocated from TP2067A, 2. Position scanned using a CAT prior to digging, 3, Trial pit back filled with arising and compacted in 300 mm layers.



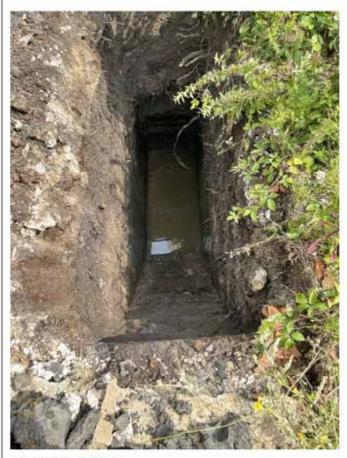
GI\_DZ7\_TP2067B

Project ID:

Project:

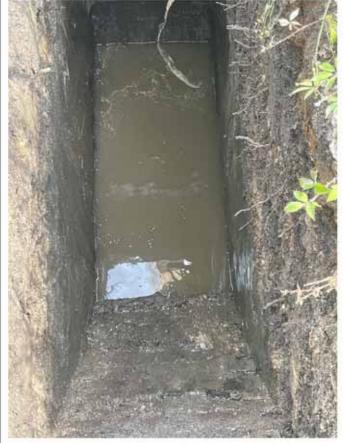
Meridian Water HIF and Infrastructure Ground Investigation

GTS-19-250



1. Complete Excavation







3. Base and groundwater

4. Excavation and soil



Photographic I	Report
----------------	--------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2067B

Project ID:

GTS-19-250



5. Spoil



# **Trial Pit Log**

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 26/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535833.95 N191855.40 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.36m AOD GI\_DZ7\_TP2068 TP AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 10.36 Reinforced concrete with rebar. [MADE GROUND] 0.70 9.66 Blackish grey, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, coal ash, slag, 0.80 В brick, concrete and flint. 0.80 ES [MADE GROUND] 0.80 PID PID=0.10 D 1.00 1 1.00 ES 1.00 PID PID=0.20 1.20 В 1.20 Soft, fissured, greenish grey mottled brown CLAY. 1.20 ES Frequent iron oxide staining. Frequent light grey fine sand / silt partings (<2mm). Fissures are randomly 1.20 PID PID=295.00 oriented, undulating and smooth. [ALLUVIUM] 1.50 В thin layer of oily sandy material and strong 1.50 ES hydrocarbon odour at 1.20 m (ES5). 1.50 PID PID=12.50 2 2.50 D 2.80 7.56 Multicoloured, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, flint and quartzite 3.00 В [KEMPTON PARK GRAVEL FORMATION] 3 3.00 ES 3.00 PID PID=0.00 3.30 В 3.30 End of Trial Pit at 3 30m 3.30 ES PID PID=0.00 4 Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.50 0.80 Stable Groundwater seepage from 1.20 m. Groundwater struck at 3.30 m. Weather Remarks

1. Position scanned using a CAT prior to digging, 2, Surface concrete broken out by JCB, 3, Trial pit terminated on encountering groundwater, 4, Trial pit

back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2068

Project ID:

GTS-19-250



1. Prior to excavation

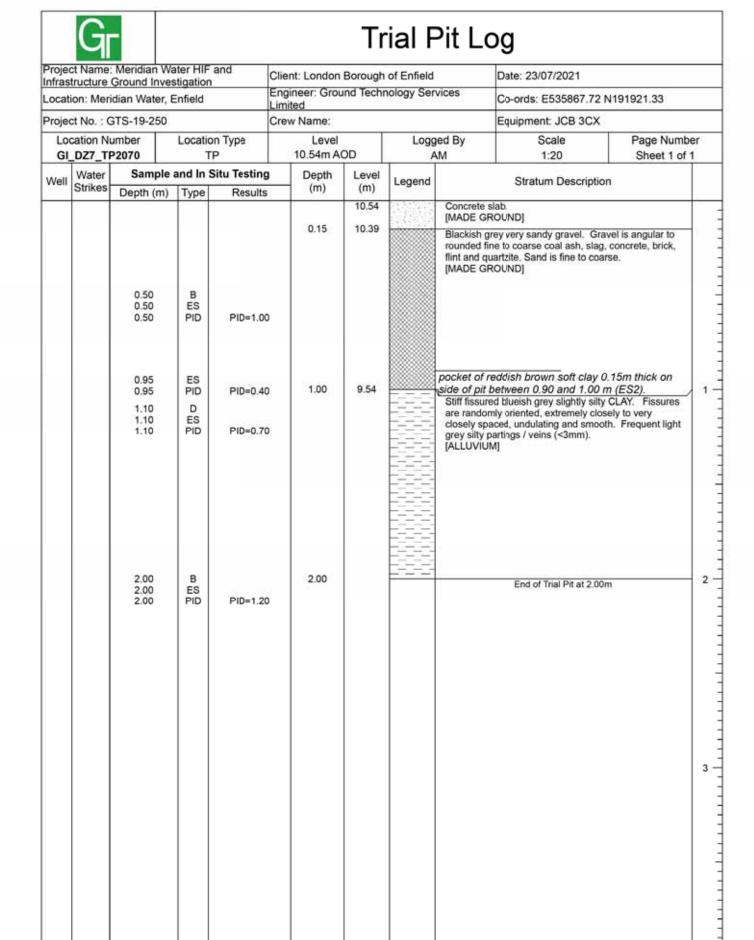
2. Complete excavation





3. Base and sides

4. Excavation and spoil



Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.50 0.70 Stable No groundwater encountered. Weather

4

#### Remarks

Position scanned using a CAT prior to digging.
 Surface concrete broken out by JCB.
 Trial pit back filled with arising and compacted in 300 mm layers.



GI\_DZ7\_TP2070

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250



1. Prior to excavation



2. Complete excavation



3. Excavation side

4. Base and backwall



GI\_DZ7\_TP2070

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250



1. Prior to excavation



2. Complete excavation



3. Excavation side

4. Base and backwall



Photographic	Report
--------------	--------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

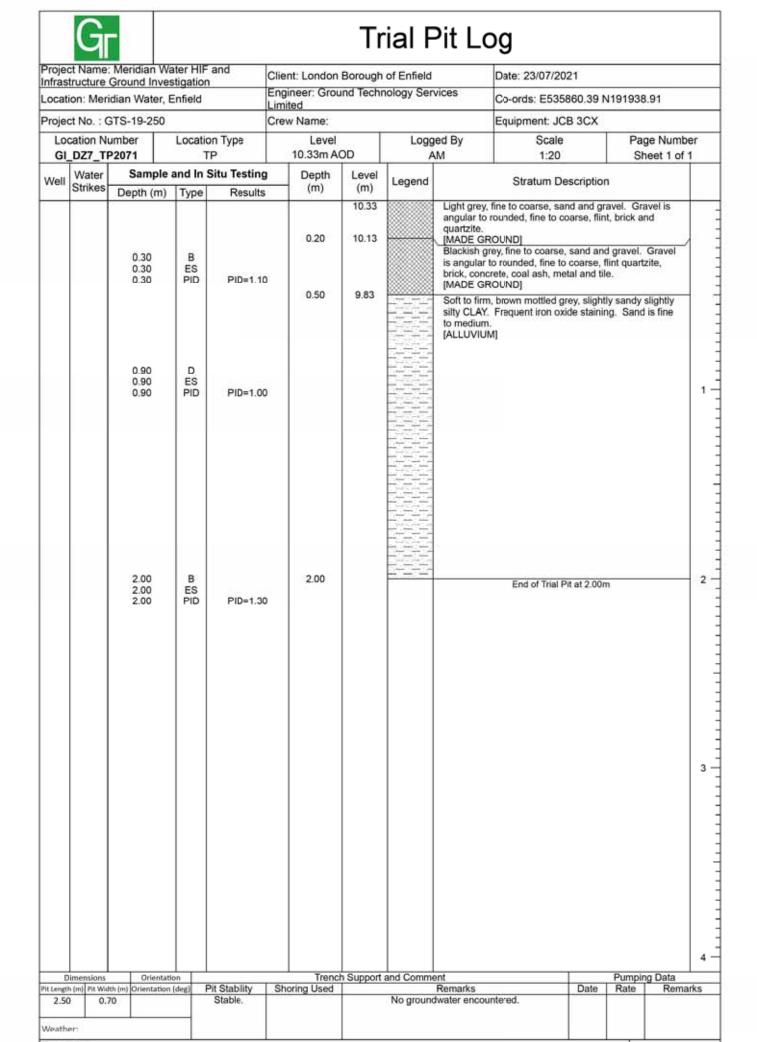
GI\_DZ7\_TP2070

Project ID:

GTS-19-250



5. Spoil



### Remarks

1. Position scanned using a CAT prior to digging, 2, Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2071

Project ID:

GTS-19-250





1. Prior to excavation

2 Excavation base and side



#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 23/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535872.14 N191951.08 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ7\_TP2072 TP 10.51m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Results Depth (m) Type 10.51 Greyish brown very sandy gravel. Gravel is angular to rounded fine to coarse flint, quartzite, concrete and brick. Sand is fine to coarse. Low cobble content of subrounded brick and concrete. [MADE GROUND] 0.30 B 0.30 ES 0.30 PID PID=0.70 0.60 ES Unknown service encountered at edge of pit at 0.60 PID PID=0.90 0.60 m. Not struck. 0.80 9.71 Soft, greenish brown mottled brown, slightly sandy, slightly gravelly clay. Gravel is angular to rounded, fine to coarse, flint and brick. Frequent white putty 0.90 D 0.90 ES material, possible ash deposit (<20 mm) and small 1.00 9.51 1 0.90 PID PID=0.70 green fragments of unidentified material. [MADE GROUND] Firm, brown, slightly sandy, slightly gravelly clay. Gravel is angular to subrounded, flint, quartzite and 9.31 1.20 brick. Sand is fine to coarse. [MADE GROUND] Greyish brown, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, slag, coal ash, flint, quartzite, brick, concrete, tile, pipe and glass. 1.50 В 1.50 ES Frequent pockets of white putty ash material, possible ash deposits (<400 mm). Medium cobble content of PID=1.20 subrounded brick, concrete and slag. [MADE GROUND] 2 2.40 D 240 End of Trial Pit at 2.40m 2.40 ES PID=0.50 2.40 PID 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg)

No groundwater encountered.

### Weather: Remarks

2.50

0.80

1. Position scanned using a CAT prior to digging, 2, Trial pit back filled with arising and compacted in 300 mm layers.

Unstable.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2072

Project ID:

GTS-19-250





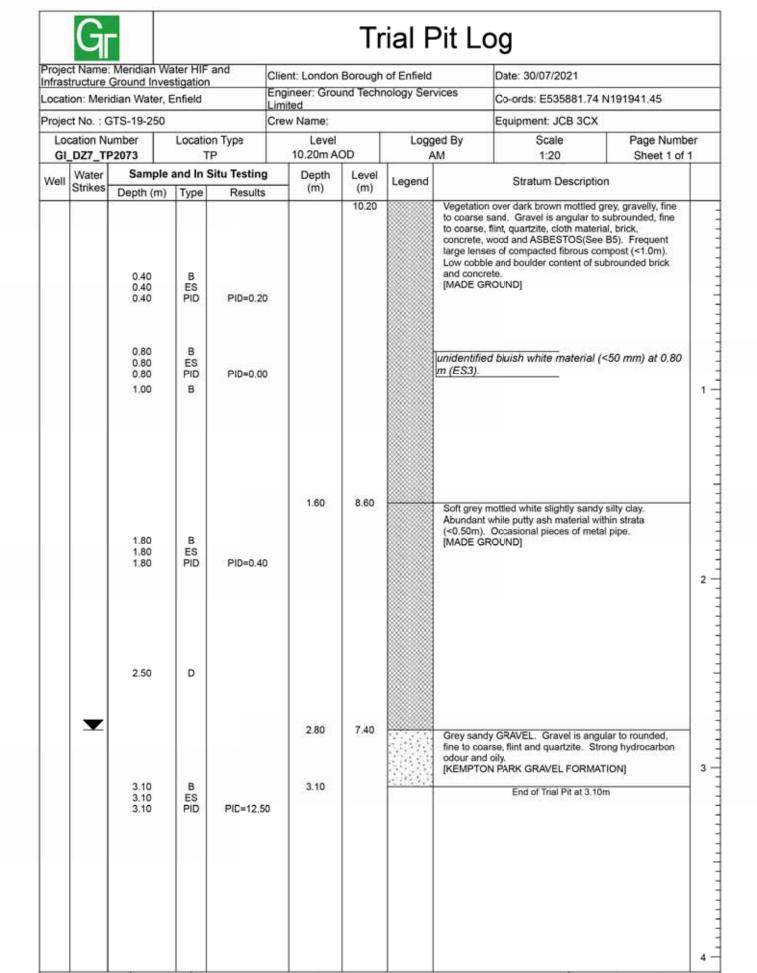
1. Prior to excavation



2. Complete excavation



2. Exposed service



Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Date Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 0.80 Stable Groundwater struck at 2.80 m. Oily. Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2, Oily sheen on groundwater. 3. Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2073

Project ID:

GTS-19-250





1. Prior to excavation

2. Complete excavation





3. Base and sides



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2073

Project ID:

GTS-19-250





5. Sides 6. Suspect material





#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 28/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535809.72 N191857.65 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZ7\_TP2074 TP 10.41m AOD AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.41 Reinforced concrete with rebar. [MADE GROUND] 0.20 10.21 Blackish grey, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, coal ash, slag brick, concrete, tile, glass, metal and plastic. [MADE GROUND] 0.50 В lens of yellowish white putty material (<0.5 m) at 0.50 ES 0.50 m (ES1) 0.50 PID PID=1.40 1.00 D 1.00 ES 1.00 PID PID=1.50 1.40 9.01 Soft to firm, fissured, greenish grey mottled brown CLAY. Fissures are randomly oriented planar and polished. Frequent black staining. Frequent light grey 1.60 В silt partings (<2mm). Slight organic odour. 1.60 ES [ALLUVIUM] 1.60 PID PID=1.80 2.00 8 4 1 2 Soft greenish grey, silty CLAY. [ALLUVIUM] D 2 10 2.50 7.91 Soft dark brown, fibrous clayey PEAT. Frequent pockets of peaty clay (<0.2m). Slight organic odour. Abundant word fragments (<100mm). 2.70 В [ALLUVIUM] 2.70 ES 2.70 PID PID=1.10 3 3.20 7.21 Greyish brown, sandy GRAVELS. Gravel is angular to rounded, fine to coarse flint and quartzite. Sand is fine [KEMPTON PARK GRAVEL FORMATION] 3.50 3.50 В End of Trial Pit at 3.50m 3.50 ES PID PID=0.80

Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Shoring Used Remarks Date Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 Stable Groundwater struck at 2.60 m. Pit collapsed due to 0.60 water ingress. Weather

4

### Remarks

Position scanned using a CAT prior to digging.
 Trial pit back filled with arising and compacted in 300 mm layers.



GI\_DZ7\_TP2074

Project:

Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

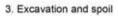




1. Prior to excavation









4. Excavation side



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_TP2074

Project ID:

GTS-19-250





5. Base and groundwater



7. Suspect material

6. Spoil

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 28/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535915.55 N192033.92 Location: Meridian Water, Enfield Drilling Equipment: Hans Tools | Dando Project No.: GTS-19-250 Crew Name: Terrier Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ7\_WS2084 WS 11.48m AOD AB 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Reinforced CONCRETE. [MADE GROUND] 0.35 11.48 Firm brown sandy gravelly CLAY. Sand fine to coarse. 0.40 ES Gravel angular to rounded fine to coarse brick 0.40 - 0.60 В concrete and flint. 0.40 PID [MADE GROUND] 0.60 ES 0.60 - 0.80В 0.60 PID 0.80 ES 0.80 - 1.10 0.90 11.13 0.80 PID Firm dark brownish grey slightly sandy slightly gravelly CLAY. Sand fine to coarse. Gravel subangular to rounded fine to coarse flint. 1.10 ES [ALLUVIUM] 1.10 - 1.20 В 1.10 PID 1.20 - 2.2010.58 1.30 1.30 - 3.20В Soft varying to firm dark brownish grey occasionally brownish grey organic CLAY with extremely closely spaced brown silt partings closely spaced black clayey 1.50 - 1.60 D amorphous peat <30mm pockets occasional white shell fragments and rare gravel. Gravel angular to rounded fine to coarse flint. [ALLUVIUM] silty between 1.95 and 2.00 m. 2 2.20 - 3.20 L peat lens between 2.40 and 2.50 m. 2.50 - 2.60D gravelly between 2.50 and 2.70 m. 3 thickly laminated between 3.15 and 3.20 m. 3.20 10.18 End of Borehole at 3.20m 4 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole completed using dynamic sampling techniques



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_WS2084

Project ID:

GTS-19-250



WS2084 1.20 - 3.20

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 25/06/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E535895.96 N191982.76 Location: Meridian Water, Enfield Drilling Equipment: Hand Tools | Dando Project No.: GTS-19-250 Crew Name: NC Terrier Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZ7\_WS2085 WS 11.46m AOD AB 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Reinforced CONCRETE. [MADE GROUND] 0.35 11.46 0.35 ES Stiff brown sandy gravelly CLAY. Sand fine to coarse. 0.35 - 0.50В Gravel angular to rounded fine to coarse brick 0.35 PID PID = 0 ppmconcrete and flint. 0.50 ES [MADE GROUND] 0.50 - 0.80В dark greyish brown between 0.50 and 0.80 m. 0.50 PID PID = 0 ppm0.80 0.80 - 0.90В 0.90 11.12 0.80 PID PID = 0 ppm Firm dark brownish grey slightly sandy slightly gravelly 0.90 ES CLAY. Sand fine to coarse. Gravel subangular to 0.90 - 1.20В rounded fine to coarse flint. 0.90 PID PID = 0 ppm [ALLUVIUM] 1.20 1.20 10.56 Soft varying to firm dark brownish grey organic CLAY 1.20 - 3.00В with extremely closely spaced brown silt partings closely spaced black clayey amorphous peat <20mm 1.40 - 1.50 D pockets and occasional white shell fragments. 1.40 PID PID = 32 ppm [ALLUVIUM] 85 degree planar polished shear between 1.20 and 1.60 m. Very tight clean. with closely spaced peat lenses (<140 mm) between 1.60 and 2.20 m. thinly laminated with shell fragment and calcareous nodules (2 mm) at 1.65 m. slightly gravelly between 1.70 and 1.95 m. Gravel is subangular to rounded medium and coarse flint. 2 10 - 2 20 n 2.10 PID PID = 137 ppm 2.20 greyish brown to dark greyish brown slightly organic to organic between 2.20 and 3.20 m. Frequent shell fragments and calcareous nodules between 2.69 and 2.70 m. silty band between 2.70 and 2.80 m. 3 thinly laminated to very thinly bedded from 3.00 to 3.10 - 3.20 3.20 m. 3.10 PID PID = 7 ppmsubrounded coarse gravel inclusion at 3.02 m. 3.20 10.26 frequent shell fragments from 3.10 m. End of Borehole at 3.20m 4 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

#### Remarks

Position CAT scanned, cored and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using dynamic sampling techniques



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZ7\_WS2085

Project ID:

GTS-19-250

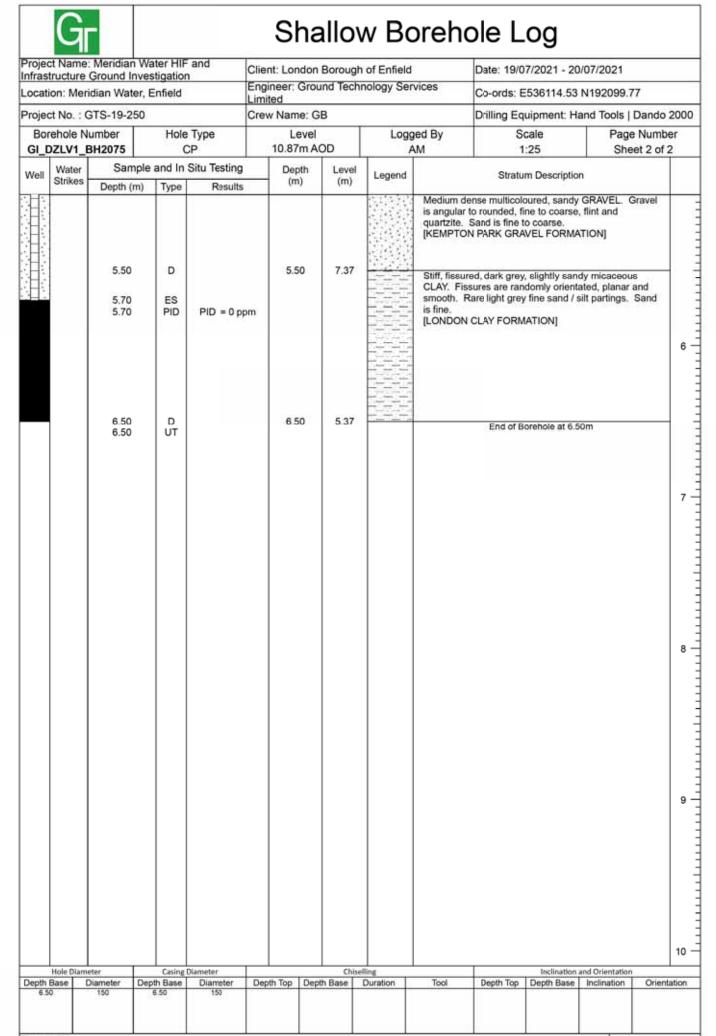


WS2085 1.20 - 3.20

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 19/07/2021 - 20/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536114.53 N192099.77 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GB Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZLV1\_BH2075 CP 10.87m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Firm, greyish brown, sandy, gravelly clay. Gravel is angular to rounded, fine to coarse, brick, flint, quartzite, tile, glass, coal ash and concrete. Sand is 0.20 ES fine to coarse. Low cobble content of subrounded PID 0.20 PID = 1 ppm 0.30 D [MADE GROUND] 0.30 ES 0.30 PID PID = 0 ppm0.60 - 0.80В 0.80 ES 0.80 PID PID = 0 ppm 1.00 D 1.50 - 1.95 В 1.50 **cSPT** N=12 (1,2/2,3,3,4) 1.80 1.80 10.87 ES Firm, grey mottled brown clay. Gravel is angular to PID = 1 ppm 1.80 PID subangular, fine to medium, flint, quartzite and brick. [MADE GROUND] 2.00 - 2.30 В 2.00 9.07 Firm fissured, bluish grey mottled brown CLAY. Fissures are randomly orientated, undulating, smooth and polished. Occasional buried rootlets. Slight organic odour. [ALLUVIUM] 2.30 ES 2.30 PID PID = 2 ppm 2.50 - 2.95 UT 3.00 D 3 3.47 EW 3.50 8.87 Medium dense multicoloured, sandy GRAVEL. Gravel 3.50 - 3.95 В is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 3.50 CSPT N=20 (2,3/4,5,5,6) 3.60 ES [KEMPTON PARK GRAVEL FORMATION] 3.60 PID PID = 0 ppm4.00 EW 4.15 EW 4.20 EW 4.30 EW 4.50 EW 4.50 EW 4.50 - 4.95 B 4.50 **cSPT** N=25 (2,4/5,6,7,7) 5 Inclination and Orientation Hole Diameter Casing Diameter Chisell Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

1. Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using dynamic sampling

techniques



#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using dynamic sampling techniques

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 20/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536155.55 N191959.35 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GB Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZLV1\_BH2078 CP 9.87m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Soft to firm, dark grey, very sandy, gravelly clay. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick, concrete, tile, coal ash and glass. 0.20 ES Sand is fine to coarse. 0.20 PID PID = 1 ppm [MADE GROUND] 0.30 ES 0.30 PID PID = 0 ppm0.50 D 0.60 В 0.80 0.80 PID PID = 2 ppm 1.00 D 1.00 9.87 Firm greyish brown, slightly sandy, gravelly clay. Gravel is angular to rounded, fine to coarse, brick, concrete, flint, quartzite and tile. Slight organic odour. 1.20 1.20 8.87 Sand is fine to coarse. PID PID = 1 ppm 1.20 [MADE GROUND] Firm, dark grey mottled brown CLAY. Frequent iron oxide staining Frequent decaying rootlets. 1.50 D [ALLUVIUM] 1.50 SPT N=6 (1,0/1,1,2,2) 1.80 8.67 Soft, greyish brown, very sandy CLAY. Sand is fine to [ALLUVIUM] 2.00 ES 2 2.00 EW 2.00 PID PID = 1 ppm 2.30 8.07 Loose multicooured, very sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 2.50 B 2.50 [KEMPTON PARK GRAVEL FORMATION] CSPT N=9 (1,1/2,2,2,3) EW 2 60 ES 2.60 PID PID = 0 ppm 2.90 EW 2.90 EW 3 3.00 EW 3.30 EW 3.30 EW 3.50 3,50 cSPT N=10 (1,1/2,2,3,3) 4 4.20 D 4.20 7.57 Stiff, fissured, dark grey, slightly sandy, micaceous CLAY. Fissures are randomly oriented, planar and smooth. Occasional light grey fine sand / silt partings (<1mm). Sand is fine 4.50 ES [LONDON CLAY FORMATION] 4.50 - 4.95 UT 4.50 PID = 3 ppm PID 5.00 D 5 Hole Diameter Inclination and Orientation Casing Diameter Chisel Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using dynamic sampling techniques

	nuctura	: Meridia	n Water HIF nvestigation	and	Client: Lor	don Borougi	h of Enfield	i	Date: 20/07/2021					
			ter, Enfield		Engineer: Limited	Ground Tech	nnology Se	rvices	Co-ords: E	536155.55	N191959.3	35		
ojec	t No. : 0	GTS-19-2	250		Crew Nam	e: GB		2.00	Drilling Ed	uipment: Ha	and Tools	Dando	20	
	ehole N	umber 3H2078		Type P	2000	evel m AOD		ged By AM	Scale Page Numl 1:25 Sheet 2 of					
/oll	Water		nple and In		Dep	oth Level	· T		1:25 Shee				Ť	
ell	Strikes	Depth (	(m) Type	Results	(m	i) (m)	Legend	Stiff fissu	ired, dark grey	77		15	ļ	
				5.2	5.67		smooth. (<1mm).	ssures are rar Occasional lig Sand is fine. N CLAY FORM End of E	ht grey fine sa	and / silt par	tings			
	Hole Diam Base (	eter Diameter	Casing Depth Base	Diameter Diameter	Depth Top	Chis Depth Base	elling Duration	Tool	Depth Top	Inclination a	and Orientation	Orient	tat	

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 21/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536185.86 N191915.37 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: GB Drilling Equipment: Hand Tools | Dando 2000 Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZLV1\_BH2079 CP 10.40m AOD AM 1:25 Sheet 1 of 2 Sample and In Situ Testing Water Depth Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results Greyish brown, fine to coarse, sand and gravel. Gravel is angular to rounded, fine to coarse, concrete, brick, flint, quartzite and coal ash. 0.20 ES [MADE GROUND] PID = 0 ppm 0.20 PID 0.30 ES 0.30 PID PID = 1 ppm 0.50 D 10.40 0.60 В 0.60 Firm brown mottled grey, sandy, slightly gravelly clay. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick and concrete. Sand is fine to coarse. 0.80 [MADE GROUND] 0.80 PID PID = 1 ppm 1.00 D 1.50 1.50 **cSPT** N=6 (1,1/1,1,2,2) 9.80 Firm, fissured, brown mottled grey CLAY. Fissures are randomly oriented, undulating, smooth and polished. Occasional buried rootlets. Frequent iron oxide staining 1.90 ES [ALLUVIUM] PID 1.90 PID = 2 ppm 2 2.00 2.40 8.80 Loose quickly becoming medium dense multicoloured, 2.50 very sandy GRAVEL. Gravel is angular to rounded, 2.50 N=9 (1,2/2,2,2,3) **cSPT** fine to coarse, flint and quartzite. Sand is fine to 2.70 ES [KEMPTON PARK GRAVEL FORMATION] 2.70 PID PID = 1 ppm 3.06 EW 3.50 3,50 CSPT N=15 (1,2/3,3,4,5) 3.90 EW 3.90 3.90 3.90 EW 3.90 EW 4.00 EW 4.00 4.50 В 4.50 cSPT N=21 (2,3/3,6,6,6) 5

#### Remarks

Depth Base

Hole Diameter

Diameter

Casing Diameter

Diameter

Depth Base

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using dynamic sampling techniques

Chisell

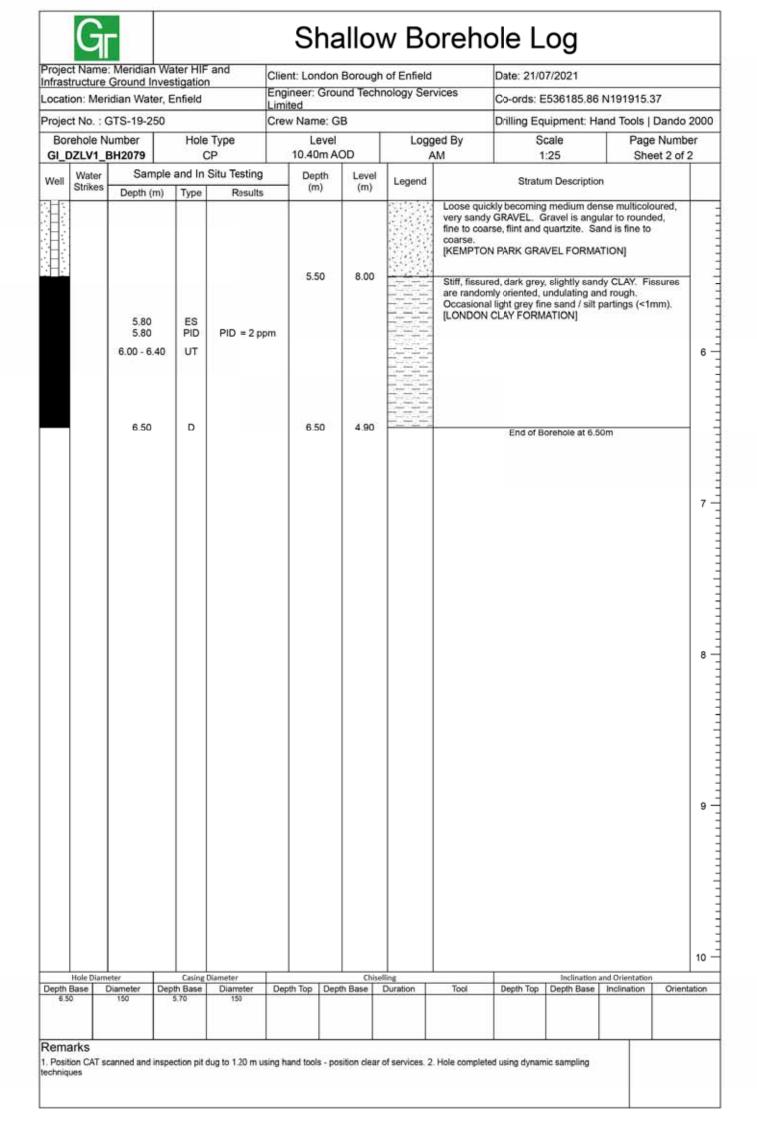
Tool

Depth Top Depth Base Duration

Inclination and Orientation

Orientation

Depth Top | Depth Base | Inclination





	$\boldsymbol{\neg}$							• • •	.a		-9				
Projec	t Name	: Meridiar Ground I	n Water	HIF	and	Clier	nt: London	Borough	of Enfield		Date: 15/07/202	21			
		idian Wat				Engi	neer: Grou	nd Techn	ology Ser	vices	Co-ords: E536084.67 N192261.61				
Projec	t No. : (	GTS-19-2	50				v Name:				Equipment: Ha	nd tools			
	ation N	umber TP2031	Lo	catio	n Type P		Level 10.10m AC	OD	Logg	ed By				ge Number	
Well	Water		ple and	d In S	Situ Testing	3	Depth	Level	Legend	Stratum Description					
	Strikes	Depth	(m) T	уре	Results		(m)	(m) 10.10		Stiff light orange brown slightly sandy gravelly CLAY.					
		0.07 - 0 0.10 - 0 0.20 0.20 0.40 0.40	.50	B B ES PID B D	PID=0.50	50				Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse flint. Rare inclusions within gravel fraction of brick, glass, ash, concrete and asphalt. [MADE GROUND]					
		0.90		D											1
		1.10 1.10		ES PID	PID=0.10	0								1 -	
							1.40				End of Trial P				
															3   4
	imensions		entation	1 0	it Stability	Ch-	Trench	Support	and Comme	Pemade		Data	Pumpin	g Data	rbo
0.50 Weath	0.	dth (m) Orient 50	Lation (deg	P	it Stability Stable	Sho	oring Used			Remarks twater enc	ountered.	Date	Rate	Rema	IKS

#### Remarks

Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated to locate
Thames Water asset and under ecological watching brief. 4. Trial pit located above concrete road. Pit extended beyond the edge of the road. Assumed
Thames Water Main located by EML techniques.



Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 15/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536064.57 N192270.58 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.29m AOD GI\_DZLV1\_TP2032 TP TB 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 10.29 Stiff, light orange brown, very sandy, very gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to rounded, fine to coarse of flint. Rare inclusions within gravel fraction of brick, concrete and asphalt. [MADE GROUND] B 0.40 0.40 0.40 ES PID PID=0.10 0.40 9.19 1.10 Stiff, dark grey, silty CLAY. Possible slight hydrocarbon odour. [ALLUVIUM] 1.40 В 1.40 D 1.40 ES PID=0.40 1.90 8.39 Very stiff, dark grey mottled orange brown, slightly sandy CLAY. Sand is fine. 2 [ALLUVIUM] BD 2.20 2.20 2.20 ES PID PID=0.00 3.00 3 End of Trial Pit at 3.00m 4 Pumping Data Trench Support and Comment Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 1.00 2.50 Stable No groundwater encountered. Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2. Large concrete obstruction (approx. 12m\*4m\*0.3m thick) in original location of pit. Pit re-located approx.. 1.5m to the west. 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2032

Project ID:



1. Location and shallow excavation

2. Complete excavation



	$\neg$									9				
roje	ct Name	: Meridia Ground I	n Water I	HF and	Clie	ent: London	Borough	of Enfield		Date: 15/07/20	21			
		idian Wa				gineer: Grou nited	nd Techr	nology Ser	vices	Co-ords: E5360	78.99 N	1192263	3.18	
Proje	ct No. : (	GTS-19-2	250			w Name:				Equipment: JCB 3CX				
	cation N		Loc	ation Type		Level	251		ged By	Scale			age Number	
GI_I		TP2033		TP	1	10.06m AC	_	1	ГВ	1:20		Si	neet 1 of	1
Well	Water Strikes	Depth		In Situ Testir De Resul		Depth (m)	Level (m)	Legend		Stratum De	scription	1		
		Depui			ıs	1 10	10.06			ark brown slightly sandy CLAY. Sand is fine.				-
		0.07 0.07 0.07	D ES	3	20	0.15	10.06		Abunda	rk brown slightly san nt rooflets. GROUND] End of Trial P			fine.	2 -
														4 -
Pit Lengt	imensions h (m) Pit Wie	Orien	ientation tation (deg)	Pit Stability	SI	Trench horing Used	Support	and Comm	ent Remarks	7.07-3-2	Date	Pumpir Rate	ng Data Rema	rks
12.0 Weath	0 4.	00		Stable				No ground	dwater end	countered.				
Death	a dea													

1. Position scanned using a CAT prior to digging. 2. Position terminated early at 0.15 m- concrete obstruction found at the base of pit. Approximately 12.00 m x 6.00 m area exposed. Did not break out due to potential proximity of Thames Water Main service. 3. Trial pt back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

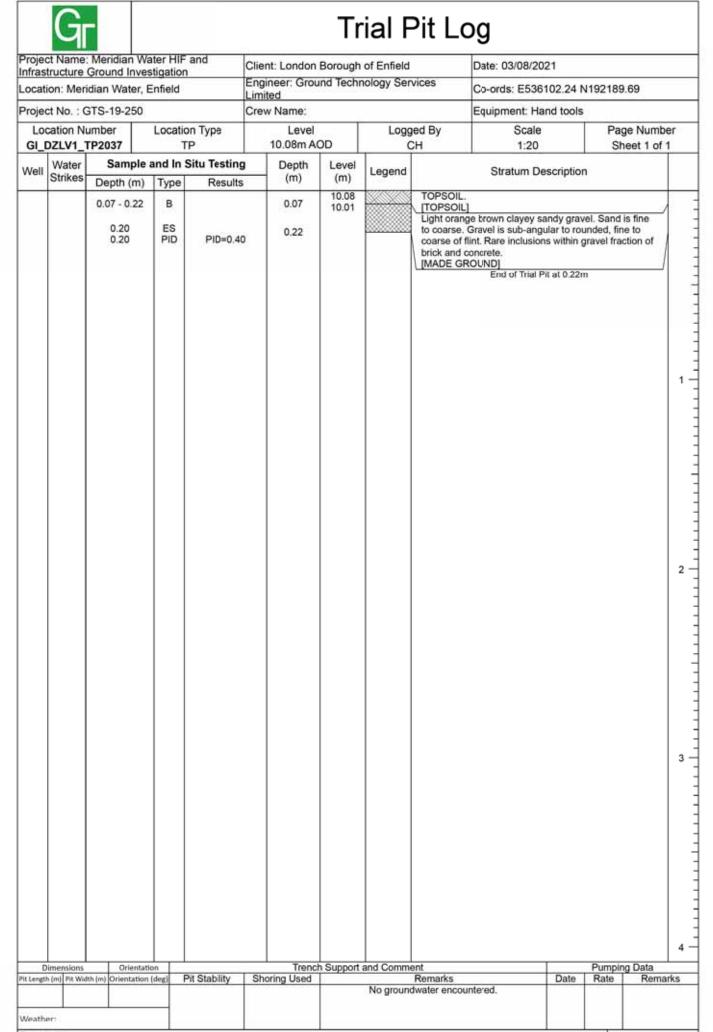
GTS-19-250

GI\_DZLV1\_TP2033

Project ID:



1. Before excavation



#### Remarks

 Position scanned using a CAT prior to digging. 2. Trial pit hand excavated due to access restrictions and terminated in concrete at 0.22 m. Likely back fill against river wall construction. 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated under ecological watching brief.



	$\sim$ II														
		Meridian V Ground Inv			Client: Lor					Date: 08/07/20	21				
Location	n: Meri	dian Water,	Enfield		Engineer: Limited	S-1515 7 11 (V)	d Techn	ology Ser	vices	Co-ords: E536		W	CHARLES CO.		
		STS-19-250			Crew Nam	ne:				Separate and the separate separate	quipment: Vacuum Extraction Unit				
	tion Nu V1_TI 43-20/	mber P2042-2		n Type P		evel 3m AOE			ed By B	Scale 1:20					
Well	Vater		e and In S	Situ Testing		52000 7	Level	Legend		Stratum De	scriptio	n			
S	trikes	Depth (m) 0.05	) Type ES	Results	3 (m	n)	(m) 11.18		Firm dark brown slightly gravelly sandy CLAY. Sand is						
	0.05 PID PID=0.10 0.10 fine to coarse, Angular to sub-rounded, brick, concard flint. Abundant rootlets. (UNIT A - ES at 0.05 n [MADE GROUND]  10.78 Stiff, light orarge brown slightly gravelly slightly sa CLAY. Gravel is fine to coarse, sub-rounded, flint a occasionally sub-angular brick, concrete. Scatterin or glass, ceramics, plastic, rebar and wire. (UNIT EEs at 1.00 m)  [MADE GROUND]  Stiff to very stiff light brown slightly sandy gravelly CLAY. Gravel is fine to coarse flint, brick and concredium cobble/boulder content of concrete, Rare inclusions of Asphalt and plastic. (UNIT C - ES at 1 m)  [MADE GROUND]  Dense black gravel of Asphalt. High cobble and boulder content of angular Asphalt. Occasional complete kerbstones (up to 1.5m long). (UNIT D - 1.00 m)							y sandy y sandy int and terings IIT B - elly oncrete, are at 1.20	1						
					1.1	10								1	
		1.00	ES	DID 0 0					at 1.00 m) [MADE GROUND]						
		1.00	PID	PID=0.20 PID=0.40			9.88		0.650.3000.0	f, dark orange brown	locally	slinhtly s	andv	-	
		1.20	B					XX-	silty CLA	Y. polentially re-work	ked in the	e vicinity	of	1	
		1.20	ES PID	PID=0.10	0 1.5	50		XX-	[ALLUVI	where is becomes b UM]	iackish b	rown. (U	NII E)	=	
		1.20	'''	1 10-0.11				XX-						]	
								X-X-X					]		
		2.50	В	1.80						2 -					
		2.50 2.50	D ES					XXXXX						]	
		2.50	PID	PID=0.20	0 2.7	70		-X3		End of Trial P	it at 2.70r	m		- 3	
														-	
														-	
														3 -	
														4	
	ensions	Orient		Pit Stability	Shoring U		Support	and Comme	ent Remarks		Date	Pumpii Rate	ng Data Rema	rks	
20.00	3.0		The Carrier	Stable	Chorang O	300		No ground	dwater enc	ountered.	2010	11000	TAGINA	no	
Weather:			-												
-vestiler:												Ц,			

#### Remarks

1. Position scanned using a CAT prior to digging, 2, 20 m long trench excavated through locations 2042, 2043 and 2044. Levels and locations of soil units vary along the length. Maximum and minimum depths given on the log. Refer to sketch for approximation of unitlevel change. 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2042-2043-2044

Project ID:

GTS-19-250





1. Before excavation

2. North face eastern half







Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2042-2043-2044

Project ID:

GTS-19-250



5. South face western half



Project Name Infrastructure	: Meridian Wa Ground Inves	ater HIF	and	Clie	nt: London	Borough	of Enfield		Date: 29/06/20	21			
	ridian Water, E				ineer: Grou	nd Techr	nology Ser	vices	Co-ords: E536	100.05 N	192151.	16	
Project No. :				Limi	ted v Name:								
Location N	And the second second second	Locatio	n Type	Ciev	Level		Loor	ged By	Equipment: JCB 3CX d By Scale Page N			e Numbe	ar.
GI_DZLV1_			Р	L	10.59m AC	ac	TB		1:20		1		
Well Water	Sample	and In S	Situ Testing	g	Depth	Level	Legend		Stratum Description				
Strikes	Depth (m)	Туре	Results	5	(m)	(m) 10.59	Logona	1 =	k brown very silty ve				
	0.30 - 0.40 0.30 - 0.40 0.30 - 0.40 0.30	B D ES PID	PID=0.2	0				is fine. (coarse fi [MADE (low cobb ]0.00 and	fine. Grave is subangular to subrounded fine to parse flint, brick, concrete, ceramics.  IADE GROUND  cobble content of concrete and brick between to and 0.30 m.				
	0.75 - 0.85 0.75	ES PID	PID=0.1	0					s black between 0. clinker/ ash.	70 and 0	.80 m, P	Possible	1
								medium brick at 1	cobbie/boulder coi 1.20 m.	ntent of c	concrete	and	
					1.45	9.14	×	Firm ligh	nt grey mottled orang	e slightly:	sandy silt	v	. [
	1.60 - 1.70 1.60 - 1.70 1.60 - 1.70 1.60	B D ES PID	PID=0.1	0				CLAY, S.	and is fine. UM]				2 -
	2.60 - 2.70 B 2.60 - 2.70 D						x_x_x						-
	3.00 - 3.10 3.00 - 3.10 3.00 - 3.10 3.00	B D ES PID	PID=0.0			7.69	X	Stiff light grey mottled yellow brown very sandy CLAY to clayey SAND. Sand is fine. [ALLUVIUM]					3
					3.25				End of Trial P	it at 3.25m			
Dimensions	Orlander	00			Transl	Sunnort	and Comm	ent			Pumping	n Data	4 -
Pit Length (m) Pit Wi	dth (m) Orientation		Pit Stability		oring Used	Support	alue -	Remarks		Date	Rate	Rema	rks
rescondent	.90		Stable	No	ot required		No groun	dwater enc	ountered.	313 405 F P 3 100			
Weather:											$\dashv$		
Remarks													

Position scanned using a CAT prior to digging, 2. Trial pit back filled with arising and compacted in 300 mm layers. 3. Trial pit excavated under archaeological supervision. 4. Trial pit excavated under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2045

Project ID:



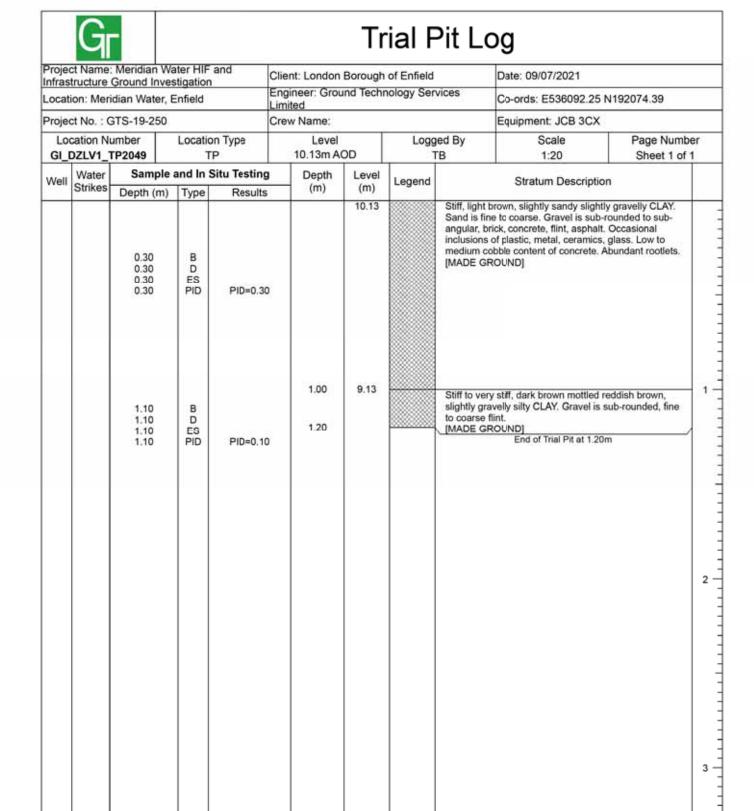


1. Before excavation

2. Complete excavation



3. Backfilled



Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.00 1.00 Stable No groundwater encountered. Weather

4

### Remarks

Position scanned using a CAT prior to digging, 2. Trial pit terminated at 1.20 m on suspected Thames Water Mains service.
 Trial pit back filled with arising and compacted in 300 mm layers.
 Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

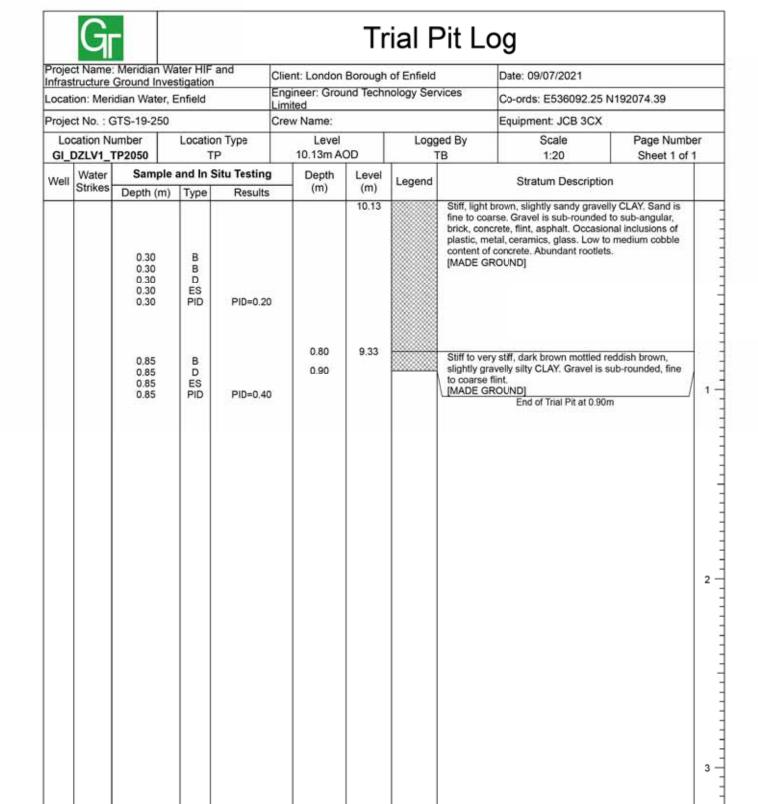
GI\_DZLV1\_TP2049

Project ID:





Before excavation
 Excavation



Trench Support and Comment Pumping Data Dimensions Orientation Pit Stability Date Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.00 1.00 Stable No groundwater encountered. Weather

4

#### Remarks

1. Position scanned using a CAT prior to digging. 2. Trial pit terminated at 0.90 m on suspected Thames Water Mains service. 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated under archaeological supervision. 5. Trial pit excavated to located Thames Water asset.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2050

Project ID:





Before excavation

2. Excavation



Project Name Infrastructure				Clier	nt: London	Borough	of Enfield		Date: 29/06/202	21			
Location: Me					neer: Grou	ind Techr	nology Ser	vices	Co-ords: E5361	162.19 N1920	25.75		
	CANAL TO ANY ALL YOU	Limolo		Limit	ted v Name:						20.70		
Project No. :	724 744 LINE LINE CO.	Location	on Type	Crev	MONTH TO STATE		Logo	od Bu	Equipment: JCI Scale		Page Numbe		
Location N GI_DZLV1_			IP Iype	l s	Level 10.22m A	ac		ed By B	1:20		Sheet 1 of 1		
Well Water			Situ Testin		Depth	Level	Legend	Stratum Description					
Strikes	Depth (m)	Туре	Results	S	(m)	(m) 10.22		Stiff light brown slightly sandy gravelly CLAY. Sand is					
	0.10 - 0.20 B 0.10 - 0.20 D 0.10 - 0.20 ES 0.10 PID PID=0.1 0.35 - 0.45 B 0.35 - 0.45 D 0.35 - 0.45 ES 0.35 - 0.45 PID PID=0.2					9.97		fine to m flint, bric concrete [MADE ( Stiff light medium. brick, co concrete	ledium. Gravel is sut k, concrete, ceramic c. Abundant rootlets. GROUND] brown sandy gravell Gravel is subangula ncrete, ceramics. Lo c. Abundant rootlets. GROUND]	bangular to sub s. Low cobble by CLAY. Sand ar to subrounde	orounded content of is fine to ed flint,		
	0.90 - 1.00 0.90 - 1.00 0.90 - 1.00 0.90	B D ES PID	PID=0.1	0	0.80	9.42	Stiff to very stiff					1	
•	2.05 - 2.15 2.05 - 2.15 2.05 - 2.15 2.05 2.30 - 2.40 2.30 - 2.40 2.30 - 2.40 2.30	B D ES PID ES PID	PID=0.0		1.95	8.27 8.02		Medium Sand is to mediu	dense yellow brown medium to coarse.	at 1.95 m. very sandy GR Gravel is suban	AVEL.	2	
				2.70					End of Trial Pi	it at 2.70m		3	
Dimensions						Support	and Comme				ping Data		
Pit Length (m) Pit Wi 2.00 0	dth (m) Orientation 90	(deg) F	Pit Stability Unstable		oring Used t required	Groundw		Remarks at 2.60 m. ater ingress	Pit collapsed due to	Date Rate	e Remar	rks	
Weather:	1,00							a.o. mgros	N.				
Remarks						1							

1. Position scanned using a CAT prior to digging, 2. Trial pit collapsed to 2.60 m bgl. when base at 2.70 m due to water strike. 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit excavated under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2052

Project ID:





1. Before excavation



2.Excavation



3. Spoil 4 Backfill



Project Name: Meridian Water HIF and Date: 28/06/2021 Client: London Borough of Enfield Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536158.95 N192000.52 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZLV1\_TP2053 TP 10.06m AOD TB 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Stratum Description Legend Strikes (m) (m) Depth (m) Type Results 10.06 Firm light orange brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint, concrete, brick with rare metal and 0.20 В ceramics, abundant rootlets. Sand is fine to coarse. 0.20 D [MADE GROUND] 0.20 ES 0.20 PID PID=0.70 0.60 9.46 Firm dark grey mottled orange brown silty CLAY. Rare coarse gravel-sized fragments of concrete, abundant B rootlets 0.70 [MADE GROUND] 0.70 ES 0.70 PID PID=0.50 1.10 8.96 Firm becoming stiff dark grey mottled orange slightly sandy CLAY. Sand is fine. [ALLUVIUM] 1.20 В 1.20 D 1.20 ES PID=0.30 1.20 1.60 8.46 Stiff light grey mottled orange brown sandy to very sandy CLAY. Sand is fine. becomes dark blackish grey with possible organics 1.85 at 1.60 m. 1.85 D 1.85 ES 2 1.85 PID PID=0.30 2.60 7.46 Medium dense yellow brown slightly gravelly SAND. Sand is fine to medium. Gravel is subangular, fine to 2.70 В medium flint 2.70 D [KEMPTON PARK GRAVEL FORMATION] 2.70 PID PID=0.20 2.85 ES 2.90 End of Trial Pit at 2.90m 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Shoring Used Remarks Date Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg) 2.50 Unstable Not required Groundwater struck at 2.80 m. Pit abandoned due to 0.90 collapse Weather Remarks

1. Position scanned using a CAT prior to digging, 2. Trial pit abandoned at 2.90 m due to collapse. 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit excavated under archaeological supervision, 5, Trial pit excavated under ecological watching brief,



GI\_DZLV1\_TP2053

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GTS-19-250

Project ID:





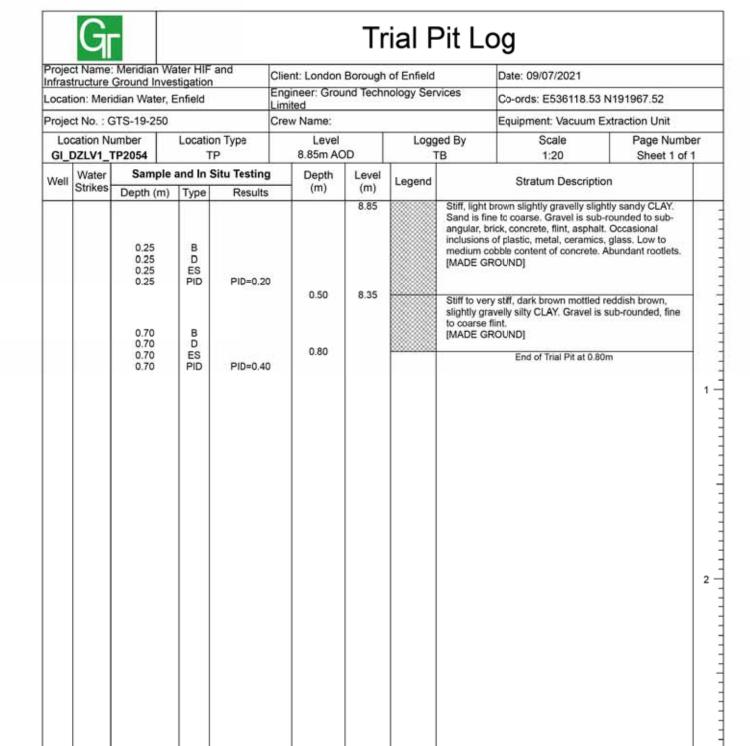
1. Before excavation



2. Excavation



3. Spoil 4. Backfilled



Trench Support and Comment Pumping Data Dimensions Orientation Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.00 1.00 Stable No groundwater encountered. Weather

3

4 -

#### Remarks

 Position scanned using a CAT prior to digging. 2. Trial pit terminated at 0.80 m on suspected Thames Water Mains service. 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2054

Project ID:





1. Before excavation

2. Excvavation



									9				
Project Name Infrastructure	: Meridia	n Water H	IF and	Clie	nt: London	Borough	of Enfield		Date: 09/07/20	21			
Location: Mer					ineer: Grou ited	nd Techr	ology Ser	vices	Co-ords: E536	118.53 N	1191967	.52	
Project No. : 0	GTS-19-2	250			w Name:				Equipment: Va	cuum Ex	traction	Unit	
Location N		Loca	tion Type TP		Level 8.85m AC	D		ed By	Scale 1:20			ge Numb neet 1 of	
Water		ple and l	n Situ Testin	g	Depth	Level			Ctt D-				
Well Strikes					(m)	(m)	Legend	Stratum Description					
Dimensions	0.15 0.15 0.15 0.15 0.45 0.45	B D ES PID B D ES PID	PID=0.4	0	0.30 0.60	8.85	and Comm	Sand is angular, inclusion medium [MADE (Stiff to visightly goto coarse [MADE (Stiff to visightly goto coars	nt brown, slightly grav fine to coarse, Grave brick, concrete, flint, as of plastic, metal, or cobble content of co GROUND] gravelly silty CLAY. Ge e flint. GROUND]  End of Trial P	el is sub-rasphalt, eramics, norete. A mottled reval is sit at 0.60n	Pumpir	o sub- nal w to rootlets. own, led, fine	1   3
Pit Length (m) Pit Wid		tation (deg)	Pit Stability Stable	Sh	oring Used	9	Add a	Remarks	ountered	Date	Rate	Rema	rks
2.00 1. Weather:	00		Stable				ino gioune	dwater enc	ounces.				
Domarke				1		l							

1. Position scanned using a CAT prior to digging, 2. Trial pit terminated at 0.60 m on suspected Thames Water Mains service, 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2055

Project ID:





1. Before excavation

2. Excavation



Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 12/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536168.46 N191873.85 Location: Meridian Water, Enfield Limited Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Type Level Logged By Scale Page Number 10.12m AOD GI\_DZLV1\_TP2056 TP TB 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 10.12 Stiff, Dark brown slightly sandy, very gravelly CLAY. Sand is fine. Gravel is angular to sub-angular, fine to coarse, brick, flint, concrete. Occasional plastic, 0.15 0.15 D ceramics, shel, textiles. Abundant rootlets. 0.25 9.87 0.15 ES [MADE GROUND] 0.31 9.81 Tarmac covering base of entire pit. Suspected buried PID PID=0.20 0.15 0.31 0.28 ES road surface. PID PID=0.40 [MADE GROUND] Concrete beneath road surface. Not broken out due to potential Thames Water Main service. [MADE GROUND] End of Trial Pit at 0.31m 2 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 3.00 2.00 Stable No groundwater encountered. Weather

#### Remarks

1. Position scanned using a CAT prior to digging. 2. Trial pit terminated on concrete filling entire base area of pit at 0.31 m. Not broken out due to potential Thames Water Mains, which was not positively identified 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit excavated under archaeological supervision. S. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Client: London Borough of Enfield Date: 12/07/2021 Engineer: Ground Technology Services Co-ords: E536168.46 N191873.85 Limited Crew Name: Equipment: JCB 3CX Level Logged By Scale Page Number 10.12m AOD TB 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Level Legend Stratum Description Strikes (m) (m) Results Depth (m) Type 10.12 Stiff, Dark brown slightly sandy, very gravelly CLAY. Sand is fine. Gravel is angular to sub-angular, fine to 0.10 coarse, brick, flint, concrete. Occasional plastic, D 0.10 0.20 9.92 ceramics, shel, textiles. Abundant rootlets. ES 0.10 0.26 9.86 [MADE GROUND] PID PID=2.00 0.10 Tarmac covering base of entire pit. Suspected buried 0.26 0.23 ES PID=1.50 road surface. 0.23 PID [MADE GROUND] Concrete beneath road surface. Not broken out due to potential Thames Water Main service. [MADE GROUND] End of Trial Pit at 0.26m 2 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.00 Stable No groundwater encountered. 12.90 Weather

#### Remarks

1. Position scanned using a CAT prior to digging. 2. Trial pit terminated on concrete filling entire base area of pit at 0.31 m. Not broken out due to potential Thames Water Mains, which was not positively identified 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit excavated under archaeological supervision. 5. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2057

Project ID:

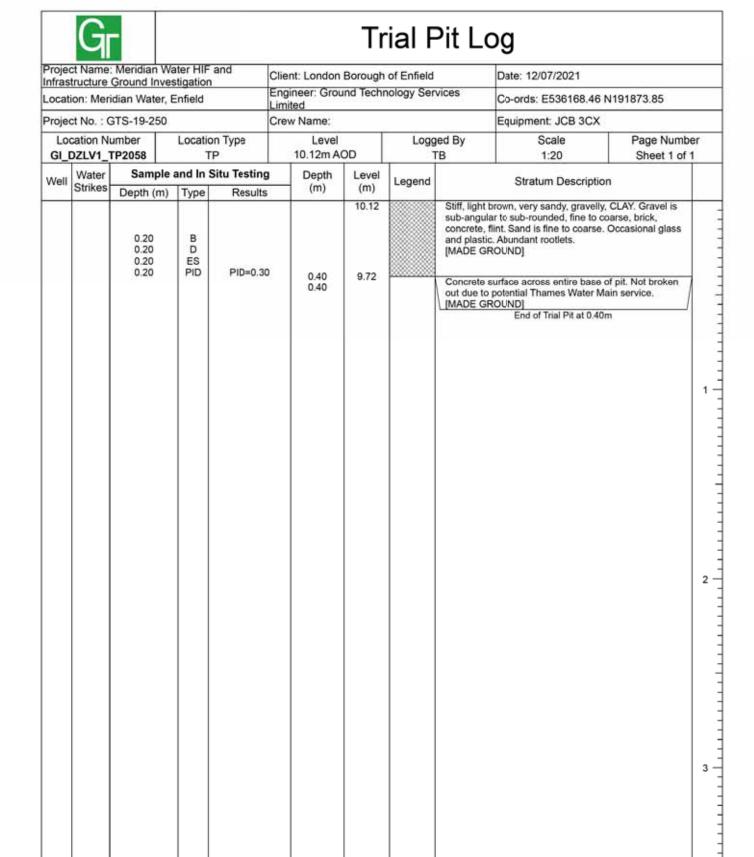


1. Before excavation

2. Concrete obstruction in excavation



3. Excavation



Trench Support and Comment Pumping Data Dimensions Orientation Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Rate Remarks 2.00 1.20 Stable. No groundwater encountered. Weather

4 -

#### Remarks

Position scanned using a CAT prior to digging. 2. Trial pit terminated on concrete filling entire base area of pit at 0.31 m. Not broken out due to
potential Thames Water Mains, which was not positively identified 3. Trial pit back filled with arising and compacted in 300 mm layers, 4. Trial pit
excavated under archaeological supervision. 5. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2058

Project ID:





1. Before excavation



3. Backfilled

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 12/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E536187.01 N191965.91 Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number TP 10.38m AOD GI\_DZLV1\_TP2063 TB 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results 10.38 Firm, dark brown, slightly sandy, gravelly CLAY. Sand is fine. Gravel is sub-angular to sub-rounded, fine to medium of flint, concrete, brick. [MADE GROUND] plastic pipe and wire inclusions between 0.30 and B D ES 0.40 0.40 0.40 PID PID=0.60 0.40 0.95 9.43 Firm becoming stiff, dark brown, mottled reddish brown, slightly sandy, silty CLAY. [ALLUVIUM] В 1,35 1.35 D ES 1.35 1.35 PID PID=0.20 2 2.40 7.98 Yellow brown slightly gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to sub-rounded, fine to coarse of flint. [KEMPTON PARK GRAVEL FORMATION] 2.70 В 2.70 2.70 D ES 2.70 PID PID=0.10 3.00 3 End of Trial Pit at 3.00m 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Rate Pit Length (m) Pit Width (m) Orientation (deg Shoring Used Remarks Remarks 2.00 1.20 Stable No groundwater encountered. Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2, Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2063

Project ID:



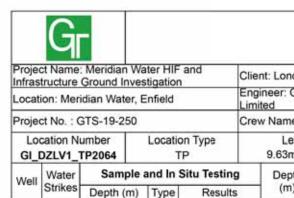


1. Before excavation

2. Excavation



3. Backfilled



Client: London Borough of Enfield Date: 14/07/2021 Engineer: Ground Technology Services Co-ords: E536080.45 N192060.78 Crew Name: Equipment: JCB 3CX Level Logged By Scale Page Number 9.63m AOD 1:20 TB Sheet 1 of 1 Depth Level Stratum Description Legend (m) (m) Depth (m) Type 9.63 Stiff, dark brown, slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to sub-rounded, concrete, flint, brick. Occasional metal, wire, wood, [MADE GROUND] 0.30 В D 0.30 0.30 ES PID=1.10 0.30 PID 0.80 8.83 Stiff, orange brown, sandy CLAY. Sand is fine. Occasional sub-rounded, medium, flints. [MADE GROUND] 1.10 В 1.10 D 1.10 ES PID PID=0.30 1.50 End of Trial Pit at 1,50m 2 3 4 -Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Rate Pit Length (m) Pit Width (m) Orientation (deg) Shoring Used Remarks Remarks 2.50 2.00 Stable No groundwater encountered. Weather

### Remarks

1. Position scanned using a CAT prior to digging, 2, Service located at base of pit at 1.50 m, Potential cast iron sewer. 3, Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2064

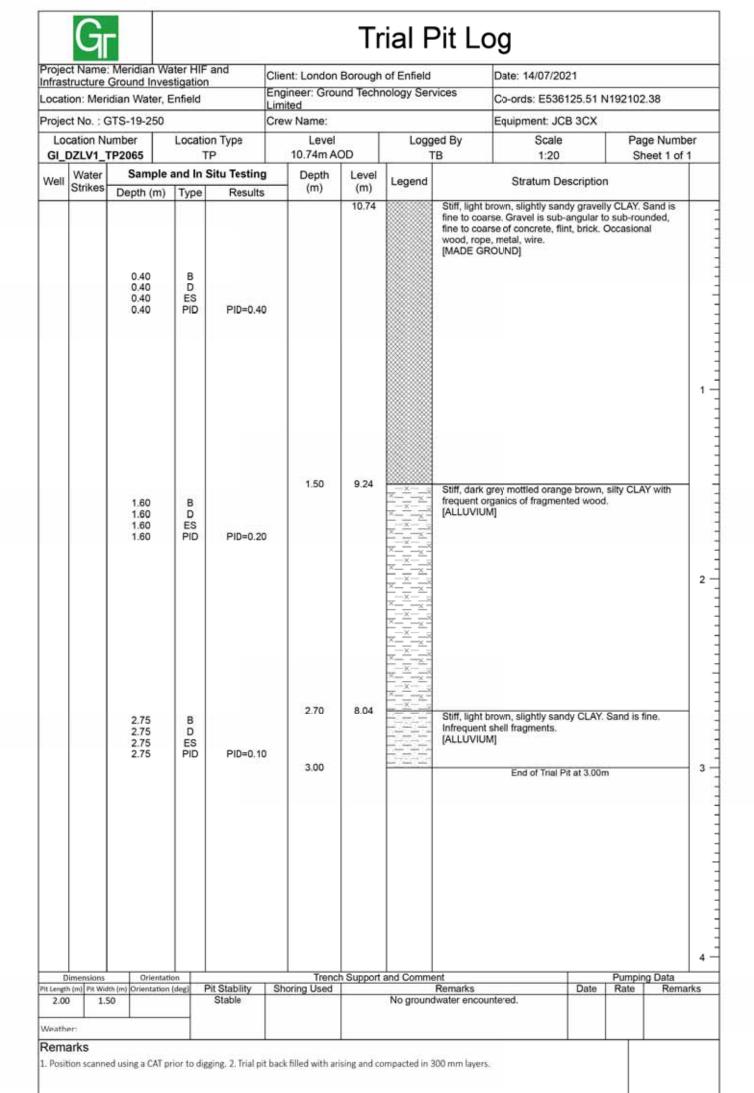
Project ID:

GTS-19-250





Before excavation
 Excavation





Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2065

Project ID:

GTS-19-250





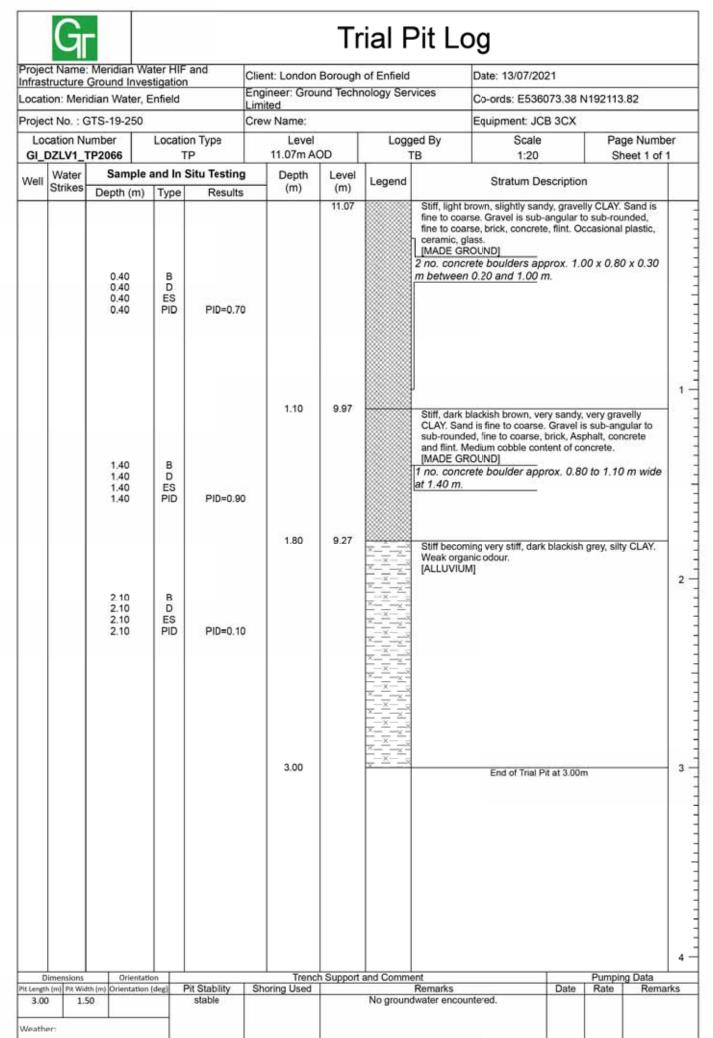
1. Before excavation



2. Excacvation



3. Spoil 4. Backfilled



#### Remarks

1. Position scanned using a CAT prior to digging, 2. Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2066

Project ID:

GTS-19-250





1. Before excavation



2. Excavation



3. Spoil 4. Backfilled

#### Trial Pit Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 30/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536180.90 N191878.58 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number 10.30m AOD GI\_DZLV1\_TP2075 TP AM 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Results Depth (m) Type 10.30 Greyish brown, fine to coarse, very sandy gravel. Gravel is angular to rounded, fine to coarse, flint, quartzite, brick, concrete, glass and coal ash. Sand is 0.20 R fine to coarse. Low cobble content of subrounded 0.20 ES concrete. 10.00 0.30 0.20 PID PID=0.10 [MADE GROUND] Blackish grey, fine to coarse, sand and gravel. Gravel 0.40 В is angular to subrounded, coal ash, brick and flint. 0.40 ES 0.50 9.80 [MADE GROUND] PID=0.20 0.40 PID Firm, greyish brown, slightly sandy, slightly gravelly clay. Gravel is angular to subrounded, fine to coarse, flint, quartzite, brick, coal ash and concrete. Low 0.70 cobble and boulder content of subrounded concrete. 0.70 ES [MADE GROUND] 0.70 PID PID=0.20 1 1.50 8.80 Firm, fissured, greenish grey mottled brown CLAY. Fissures are randomly oriented, planar and smooth. [ALLUVIUM] 1.70 В 1.70 ES PID PID=0.60 2 frequent pockets of peat (<0.30 m thick) between 2.20 В 2.10 and 2.80 m. Slightly gravelly, angular to subangular, fine, flint and quartzite. 2.50 D 2.80 7.50 Brown, slightly silty very sandy GRAVEL. Gravel is angular to rounded, fine to coarse, flint and quartzite. Sand is fine to coarse. 3.00 3.00 [KEMPTON PARK GRAVEL] 3 3.00 ES End of Trial Pit at 3.00m PID=0.50

Trench Support and Comment Pumping Data Orientation Dimensions Date Pit Stability Shoring Used Remarks Rate Remarks Pit Length (m) Pit Width (m) Orientation (deg 2.50 Stable Groundwater struck at 3.00 m. 0.60 Weather

4

#### Remarks

Position scanned using a CAT prior to digging.
 Trial pit back filled with arising and compacted in 300 mm layers.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2075

Project ID:

GTS-19-250





1. Prior to excavation

2. Complete excavation





3. Base and side

4. Spoil



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TP2075

Project ID:

GTS-19-250



5. Backfilled



# Trial Pit Log

Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 28/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536107.23 N191968.00 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Equipment: JCB 3CX Location Number Location Type Level Logged By Scale Page Number GI\_DZLV1\_TT2008 TP 9,70m AOD 1:20 Sheet 1 of 1 Sample and In Situ Testing Depth Water Level Well Legend Stratum Description Strikes (m) (m) Results Depth (m) Type 9.70 Greyish brown, fine to coarse sand and gravel. Gravel is angular to rounded, fine to coarse, flint quartzite, brick, concrete, asphalt, tile, coal ash, glass and metal. Hight cobble content of subangular to subrounded, concrete and brick. 0.30 ES [MADE GROUND] tarmac / concrete hardstanding (ES1) between 0.20 and 0.60 m. 0.50 В D 0.50 0.50 ES 0.50 ES 0.50 PID PID=0.90 0.50 PID PID=1.00 0.90 8.80 Firm, fissured brown mottled grey, slightly silty CLAY. Frequent iron oxide staining. Fissures are randomly oriented, planar and smooth. 1.10 В [ALLUVIUM] 1.10 ES 1.10 PID=0.80 frequent light grey silt partings (<2 mm thick) between 1.60 and 2.20 m. Slightly gravelly, 1.70 D angular to subangular, fine to medium, flint and quartzite. 2 7.50 2.20 Brown mottled grey, fine to coarse SAND and GRAVEL. Gravel is angular to rounded, fine to coarse, 2.30 В 2.30 flint and quartzite. 2.30 ES [KEMPTON PARK GRAVEL FORMATION] End of Trial Pit at 2.30m PID PID=0.50 3 4 Trench Support and Comment Pumping Data Orientation Dimensions Pit Stability Date Pit Length (m) Pit Width (m) Orientation (deg Shoring Used Rate Remarks 2.50 10.00 Stable Weather

#### Remarks

1. Position scanned using a CAT prior to digging, 2. Trial pit is T- shaped which extends across a 5.0m buried road and progresses down the side of the hardstanding to 2.3m. ES2 and B3 are taken from the west side of the road (others from the east where the pit was progressed). 3. Trial pit back filled with arising and compacted in 300 mm layers. 4. Trial pit excavated under archaeological supervision. 5. Trial pit excavated to locate Thames Water asset and under ecological watching brief.



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TT2008

Project ID:

GTS-19-250





1. Prior to excavation

2. Excavation part 1





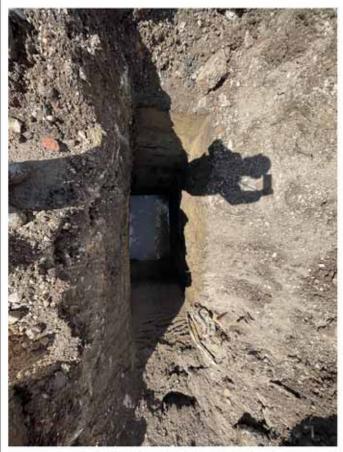


Project:

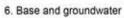
Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TT2008

Project ID: GTS-19-250



5. Complete excavation deep section







7. Side and base with groundwater

8, Spoil 1



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_TT2008

Project ID:

GTS-19-250





9. Spoil 2

10. Backfilled part 1



#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 29/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Location: Meridian Water, Enfield Co-ords: E536114.17 N192100.55 Project No.: GTS-19-250 Crew Name: Drilling Equipment: Hand Tools | Archway Dart Borehole Number Hole Type Level Logged By Scale Page Number 10.75m AOD GI\_DZLV1\_WS2075 WS ND 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Well Legend Stratum Description Strikes (m) (m) Depth (m) Type Results Firm brown sandy gravelly CLAY. Sand fine to coarse. Gravel angular to subrounded fine to coarse flint brick [MADE GROUND] gravelly between 0.38 and 1.54 m. 1.00 - 1.20 ES rootlets between 1.00 and 2.15 m. 1.00 PID PID = 0 ppm 1.24 10.75 Very stiff fissured greyish brown slightly sandy slightly gravelly slightly organic CLAY. Sand fine to coarse. 1.30 - 1.50 ES 1.30 PID PID = 0 ppmGravel angular to rounded fine to coarse flint. Fissures 0-90 degrees very closely spaced planar smooth tight with orangish prown silty sand infill. [ALLUVIUM] 1.90 9.51 Stiff grey motted brown slightly organic CLAY with extremely closely spaced orangish brown silt partings 2.00 - 2.20 ES and white root traces and occasional shell <5mm PID PID = 0 ppm 2.00 fragments. [ALLUVIUM] infill from strata above between 2.00 and 2.22 m. firm greyish brown silty with black organic partings between 2.54 and 2.78 m. No root traces. 2.78 8.85 End of Borehole at 2.78m 3 4 Hole Diameter Inclination and Orientation Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation 1. Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services, 2. Hole completed using dynamic sampling techniques

Ground Investidian Water, EGTS-19-250 umber VS2078 Sample	stigation Enfield				ugh of Enfiel	d	Date: 20/0	7/0004			
e Ground Investigation eridian Water, Enfield GTS-19-250 Number Hole Ty WS2078 WS Sample and In Situ			Engineer				Date. 29/0	1//2021			
vS2078 Sample				Ground Te	chnology Se	ervices	Co-ords: E	536155.83	N191959.8	39	
eridian Water, Enfield  GTS-19-250  Number Hole Type WS WS  Sample and In Situ Te  Depth (m) Type Re  1.10 - 1.30 ES 1.20 - 2.00 L  1.70 - 1.90 ES  2.00 - 3.00 L		Crew Nan	ne:	90 10	7.00	Drilling Eq	uipment; Ha	and Tools	Archwa	y Da	
Well   Well   Wilder   Sample and In Situ Testing   Depth   Care   Depth   Care   Depth   Care   Depth   Care   Depth   Dept											
22.07.00 (20.00 C)			De		/el Legend						
Depth (m)	Туре	Results	(n	n) (m	1)	Soft to firr is angular concrete,	n dark grey ve to rounded fi ash and glass	ery sandy gra	velly clay. G lint, brick,	iravel	
1.20 - 2.00 L			1.0	9.8	31	silt parting [ALLUVIU mottled br	as and rootlets [M] own with ora	angish brow		aced	1-
1.70 - 1.90			1.0	52 8.8	31	slightly gra- Gravel and flint. black from Firm light to coarse.	avelly band to gular to subs 1.58 to 1.6 brownish gre	between 1.5 rounded fine 2 m.	and medic	um	2.
2.00 - 3.00	t		2.0	00 8.1	19	Multicolor to rounde fine to co	nations (2 m ired, very san d, fire to coar arse.	dy GRAVEL. se, flint and q	Gravel is an uartzite. Sa		
			3.0	00 7.8	31		End of B	orehole at 3.0	0m		3
			Depth Top			Tool	Depth Top		_	Orienta	4 ation
۰	1.20 - 2.00 1.70 - 1.90 2.00 - 3.00	1.20 - 2.00 L  1.70 - 1.90 ES  2.00 - 3.00 L	1.20 - 2.00 L  1.70 - 1.90 ES  2.00 - 3.00 L	1.10 - 1.30	1.10 - 1.30 ES 1.20 - 2.00 L 1.62 8.8 2.00 - 3.00 L 2.00 8.1	1.10 - 1.30 ES 1.20 - 2.00 L  1.70 - 1.90 ES  2.00 - 3.00 L  3.00 7.81	1.10 - 1.30 ES 1.20 - 2.00 L  1.62 8.81 Sill gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 sightly gray silt parting [ALLUVIL] mottled br between 1 silt parting [ALLUVIL] mottled	1.10 - 1.30 ES 1.20 - 2.00 L  1.70 - 1.90 ES  1.70 - 1.90 ES  1.82 Still parings and rootlets [ALLUVIUM] mottled brown with ora between 1.20 and 1.5i mottle	1.10 - 1.30 ES 1.20 - 2.00 L  1.62 8.81 Singley organisa and rootlets.  1.70 - 1.90 ES  1.70 - 1.90 ES  1.82 8.81 Singley organisa and rootlets.  1.70 - 1.90 ES  1.82 8.81 First from 1.45 to 1.62 m.  1.82 Singley organisa and rootlets.  1.70 - 1.90 ES  1.82 8.81 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 to 1.62 m.  1.86 First from 1.58 to 1.62 m.  1.86 First from 1.58 to 1.62 m.  1.87 First fight brownish grey very sandy to coarse.  1.88 First from 1.45 to 1.62 m.  1.89 First from 1.45 to 1.62 m.  1.80 First from 1.45 to 1.62 m.  1.80 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.80 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.86 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.81 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.82 First from 1.45 to 1.62 m.  1.83 First from 1.45 to 1.62 m.  1.84 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1.85 First from 1.45 to 1.62 m.  1	1.10 - 1.30 ES 1.20 - 2.00 L  1.70 - 1.90 ES  1.82 8.81	1.10 - 1.30 ES 1.20 - 2.00 L  1.10 - 1.90 ES  1.10 ES  1.1



Photograp	hic Report
-----------	------------

Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_WS2078

Project ID:

GTS-19-250



WS2078 1 - 2

#### Shallow Borehole Log Project Name: Meridian Water HIF and Client: London Borough of Enfield Date: 28/07/2021 Infrastructure Ground Investigation Engineer: Ground Technology Services Co-ords: E536185.65 N191914.37 Location: Meridian Water, Enfield Project No.: GTS-19-250 Crew Name: Drilling Equipment: Hand Tools | Archway Dart Borehole Number Hole Type Level Logged By Scale Page Number GI\_DZLV1\_WS2079 WS 10.35m AOD ND 1:20 Sheet 1 of 1 Sample and In Situ Testing Water Depth Level Legend Stratum Description Well Strikes (m) (m) Depth (m) Type Results Greyish brown fine to coarse sand and gravel. Gravel is angular to rounded fine to coarse concrete, brick [MADE GROUND] 0.60 10.35 Very stiff brown sandy very gravelly CLAY. Sand fine to coarse. Gravel angular to subrounded fine to coarse flint brick and clinker. [MADE GROUND] 1.00 - 1.20 ES 1.00 PID PID = 0 ppm 1.20 - 2.001.24 9.75 1.25 - 1.45 ES Firm greyish brown sandy CLAY with reddish brown 1.25 PID PID = 0 ppm silty sand partngs and root traces. Sand fine and medium. [ALLUVIUM] 1.46 9.11 1.50 - 1.70 ES very sandy slightly gravelly between 1.36 and 1.46 PID PID = 0 ppm 1.50 m. Sand is fine to coarse. Gravel is angular to rounded fine and medium flint. Brown sandy GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse flint and occasional 1.80 - 2.00 1.80 8.89 ES quartz. PID PID = 0 ppm 1.80 [ALLUVIUM] greyish brown clayey from 1.60 to 1.75 m. 2.00 - 3.00 L 2 dark greyish trown sandy very gravelly organic clay band from 1.75 to 1.80 m. Stiff fissured grey mottled brown slightly organic CLAY with extremely closely spaced orangish brown silt partings and black root traces. Fissures 0-90 degrees very closely spaced planar smooth tight clean. [ALLUVIUM] light brown mottled grey from 1.92 to 2.00 m. 2.50 - 2.70 ES 2.50 8.55 probable infill from gravel strata above between 2.50 PID PID = 0 ppm 2.00 and 2.25 m. fissures absent between 2.00 and 2.75 m. pocket of black organic clay with greyish brown sandy gravel between 2.15 and 2.26 m. band of brownish grey sandy gravelly clay between 2.26 and 2.50 m. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Sand and 3.00 7.85 3 gravel fractions increase with depth. Light brown sightly sandy GRAVEL. Sand fine to coarse. Gravel angular to rounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION] End of Borehole at 3.00m 4 Inclination and Orientation Hole Diameter Casing Diameter Chiselling Depth Base Diameter Depth Base Diameter Depth Top Depth Base Duration Tool Depth Top | Depth Base | Inclination Orientation

#### Remarks

Position CAT scanned and inspection pit dug to 1.20 m using hand tools - position clear of services.
 Hole completed using dynamic sampling techniques



Project:

Meridian Water HIF and Infrastructure Ground Investigation

GI\_DZLV1\_WS2079

Project ID:

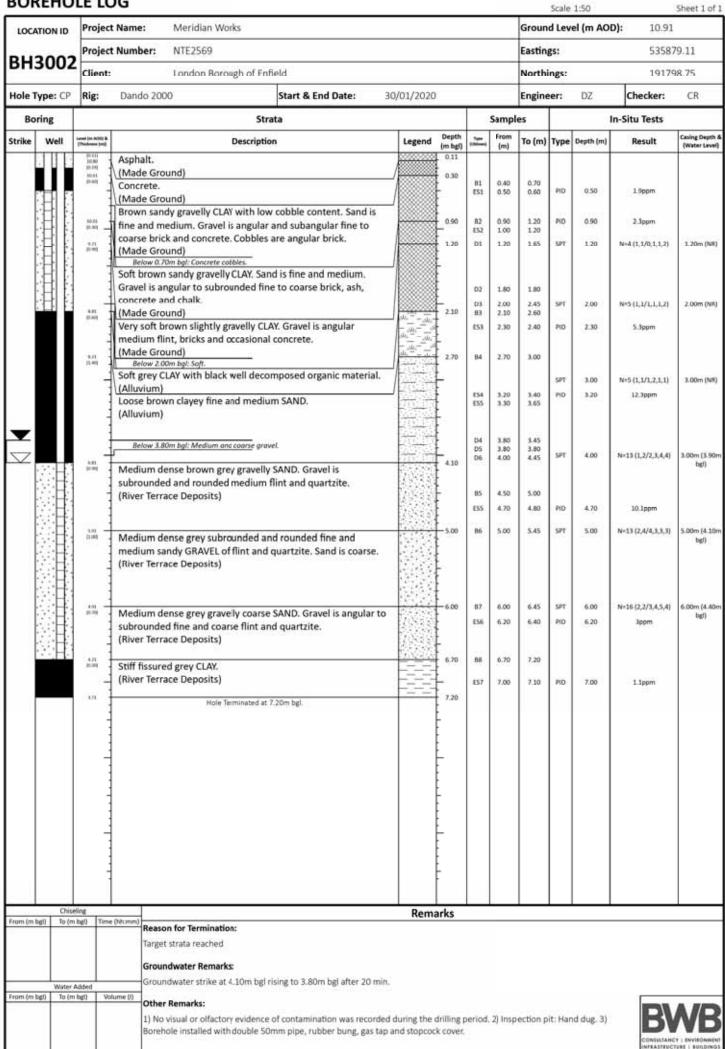
GTS-19-250



WS2079 1 - 3

BORFHOLF LOG

LOCA	TION ID	Projec	t Name: Meridian W	/orks					Groun	d Lev	el (m AO	D): 10.98	
		Projec	t Number: NTE2569					-	Eastin	gs:		53586	2.44
BH:	3001	Client	London Bor	ough of Enfield					North	ings:	3	19182	6.90
Hole T	ype: CP	Rig:	Dando 2000	Start & End Date:	27/01/2020	- 28/0:	1/202	0	Engine	eer:	DZ	Checker:	CR
	ring			Strata				Sampl	les			In-Situ Tests	
Strike	Well	Laveri (m. ACRI); B. [Thirdness (mil)		Description	Legend	Depth	Type	From	1	Type	Depth (m)	Result	Casing Depth 8
	THE	(0.00) 10.87	Asphalt.			(m bgl) 0.11	100000	(m)	25.10.5			1.0000000	(Water Level)
		10.00 10.00	(Made Ground) Concrete.		_/	0.32	81 ES1	0.30	0.50	PID	0.30	2.3ppm	
	H	D1.000	(Made Ground)		_	0,50	812 ES2	0.60	1.00	PID	0.70	2.9ppm	
	HII		[4] [2] 전 : (1) 이 : (1) [4] 전 : (1) [4] T	welly fine and medium SAND. Gravel it coarse brick, concrete, ash, coal,	5		334	0.70	0.30	100	07000		
		- 7	flint and clinker.				D1	1.20	1.65	SPT	1.20	N=18 (2,4/5,4,4,5)	1.20m (NR)
	HIII	3	(Made Ground) Medium dense black slig	ghtly gravelly fine SAND. Gravel is	<b>-</b>  ‱					PID	1.20	1.8ppm	100
				ine and coarse brick, ash, flint and odour between 0.50m bgl and 1.80m									
	1		bgl.	oddar between oldani bgi dha 2.00m		-	02	2.00	2.00	SPT	2.00	50 (5,14/50 for 134mm)	2.00m (1.80m bgl)
		198	(Made Ground)  Between 1.80m bgl and 2.0	Om bgl: Concrete cobbles.		2.40	83	2.40	2.80				100
		11.00j		ndy gravelly CLAY with partially	1			2.40	1.00	PID	2.50	2.5ppm	
¥			decomposed greenish b subrounded fine flint. Sa	rown rootlets. Gravel is angular to and is fine.			San d						
		- 7	(Alluvium)				D3	3.00	3.45	_SPT	3.00	N=2 (1,0/0,1,0,1)	3.00m (NR)
$\sim$		1.18 31.90	Firm grey sandy gravelly	CLAY with partially decomposed		3.40	84	3.50	4.00				
			brown organic material. and medium.	Gravel is angular fine flint. Sand is fin	е —								
			(Alluvium)			-	D4	4.00	4.45	SPT	4.00	N=13 (1,0/3,3,3,4)	4.00m (3.30m bgf)
	300 E 2	is inter-	Loose grev gravelly coar	se SAND. Gravel is subangular to		4.30							-
			rounded fine and mediu	m flint and quartzite.	14.3		85	4.50	5.00				
		- 52	(River Terrace Deposits)			2.2	653	4.90	5.00	PID	4.90	6.3ppm	
	H	D.M.	Medium dense grey sub sandy GRAVEL. Sand is o	angular to rounded fine and medium		-5.00	86	5.00	5.45	SPT	5.00	N=8 (3,2/1,2,3,2)	5.00m (3.90m bgl)
	$\Box$	- 3	(River Terrace Deposits)	Gerse.			£54	5.30	5.40				
	$\cdot \cdot \cdot H$	4.00			1133	6.10	87	6.00	6.45	SPT PID	6.00	N=15 (3,3/3,3,4,5) 0.8ppm	6.00m (3.10m bgl)
		8140	Stiff fissured grey gravel rounded fine flint and qu	ly CLAY. Gravel is subangular to uartzite.			ESS.	6.30	6.40		1.3.13.1		
		449	(London Clay Formation	Terminated at 6.45m bgl.	1	6.50							
		- 2	1702			_							
		-				-							
		-				-							
		:											
		_											
		-				-							
	Chise				Rema	arks						l	
From (m b	bgl) To (m	MBU Time	Reason for Terminat										
			Target strata reached										
			Groundwater Remar Groundwater strike a	ks: t 3.40m bgl rising to 2.90m bgl after 20 mi	n.								
From (m b	Water		Other Remarks:		25								
			1) Slight hydrocarbon	odour noted between 0.50m bgl and 1.8	Om bgl. 2) Ins	pection	pit: H	and dug	g. 3) Bore	ehole i	installed w	rith B	NR
			double 50mm pipe, r	ubber bung, gas tap and stopcock cover.								CONSULTANC	T I ENVIRONMENT



LOCA	-	Project	t Name: Meridian Works			7.1	Groun	d Lev	el (m AO	OD): 10.88	SHEEL TOLT
0.00000		Project	t Number: NTE2569			- 1	Easting			53587	
BH	3002a	Client:					Northi			19179	
Hole 1	Type: CP	Rig:	Start & End Date:	07/01/2020			Engine	er:		Checker:	CR
_	oring		Strata		- 60	Sample	es		1	In-Situ Tests	
	000000000000000000000000000000000000000	Lavel (ni. ACR)) B. [Thickness (nt)]		Legend Depth	_			Туре	Depth (m)		Casing Depth &
Strike	000000000000000000000000000000000000000	Total ja Addita		Legend (m bgl)	_	From (m)		Туре	_		Casing Depth & (Water Level)
	Chiseli	ling	1	Remarks							
From (m	bg() To (m.)	bg() Time	Reason for Termination:  Unable to penetrate concrete,  Groundwater Remarks:  No groundwater encountered.  Other Remarks:  1) Borehole backfilled with arisings.	Remarks						BN	<b>VB</b>

LOCATION ID												
	Projec	t Number: NTE2569						Eastin	gs:		53577	77.46
BH300	Client	: London Boroug	th of Enfield					North	ings:	3	19180	18.49
Hole Type: CP	Rig:	Dando 2000	Start & End Date:	28/01/2020	- 29/0	1/202	0	Engine	eer:	DZ	Checker:	CR
Boring	16.	D41140 E000	Strata	ed ad ease	2370		Sampl	1 -	T		In-Situ Tests	
	Lamas in a service &			2.000	Depth	_	From	1			0 (a-20), 1020000 102000 10	Casing Depth
Strike Well	Lavel (ni. ACR)) & [(Nichress (ni)) ((i. 52)		Description	Legend	(m bgl)	Type ((Antest)	(m)	To (m)	Туре	Depth (m)	Result	(Water Level
	96.50 96.30 96.30	Asphalt. (Made Ground)			0.12							
NH C	30.49 31.40	Concrete. (Made Ground)			0.40	81	0.40	0.70				
	30.09 01.30	Brown clayey gravelly fine S	AND. Gravel is angular to	~	0.80	851 82	0.70	0.90 1.20	PID	0.70	2.6ppm	
[:]	11.00	subrounded fine and coarse (Made Ground)	brick, concrete and flint.	1	-	Lee T	51545			0.2902.11	27185 - 27214 ASSA	USE ANALY
1:111		Dark brown black gravelly f	ine and medium SAND. Gravel is	-		01	1.20	1.65	SPT	1.20	N+5 (2,2/1,2,1,1)	1.20m (NR)
		angular and subangular ash (Made Ground)	, coal, brick, concrete and clinker.			A SECTION AND A SECTION ASSECTATION ASSECT						
						83 ES2	1.70	2.00 1.90	PID	1.80	6.5ppm	
	11 ool 8 50	Soft grey CLAY with black w	ell decomposed organics.		-2.00	02	2.00	2.45	SPT	2.00	N=5 (1,1/1,1,1,2)	2.00m (NR)
		(Alluvium)										
				====		84 ES3	2.50	3.00	PID	2.70	21ppm	
			15007		3.00	UI	3.00	3.45			35%	
	(1.00)	Soft black peaty CLAY. Pea: (Alluvium)	well decomposed.	m-2-m-	- ***		3.00	3.45				
_81		(Alloviolity		N 10 X 2 10 10		85	3.50	3.50				
<b>-</b>				141, × - 141, ×		D3 ES4	3.50 3.70	4.00 3.80	PID	3.70	20.4ppm	
$\nabla$		Below 4.00m bgl: Firm with ang	ules from flint occural	* 34 34 34 34 34.	_	D4	4.00	4.45	SPT	4.00	N=10 (3,2/2,2,3,3)	3.00m (3.90r
THE STATE OF	(I.W)	Medium dense grey subang	gular to rounded fine to coarse		4.10	86	4.25	4.75			0.45-22-2	bgl)
E		sandy GRAVEL of flint and o (River Terrace Deposits)	uartzite. Sand is coarse.									
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,										
	.] -	1			-	87 88	5.00	5.45	SPT	5.00	N=18 (1,2/4,4,4,6)	5.00m (4.70r bgl)
	]				-	ESS.	5.20	5.30	PID	5.20	16ppm	Nacr.
B					-							
		1										
	-	Below 6.00m bgl: Dense.			-	D5	6.00	6.45	SPT	6.00	N=26 (2,2/4,5,8,9)	6.00m (5.30r bgl)
	1											
	1	1										
H	]				7.00	89	7.00	7.50				
	1000	Stiff fissured grey gravelly C rounded fine flint and quar	LAY. Gravel is subangular to			£56	7.20	7.30	PID	7.20	23.6ppm	
	1.00	(London Clay Formation)			7.50						350	
		Hale Terr	ninated at 7.50m bgl.		-							
	-				-							
		1										
	.	]			-							
		1			-							
	-	1			-							
					-							
	seling m bg() Tim	e (hhumm)		Rema	arks							
100		Reason for Termination										
		Target strata reached										
		Groundwater Remarks:  Groundwater strike at 2.	00m bgl rising to 1.70m bgl after 20min	n, second strik	e at 4.14	Om hel	risine t	o 3 60m	bel a	fter 20 min	i.c	
	r Added m bg() V	olume (0)	Som officiality to tayour official control	, second strike	014.1	out of	esait (	5 5,000	- ugr d	LV EV IIII		
		Other Remarks:  1) No visual or olfactory										

BORE	:HU	1							Linear		1:50	Annual Control of the	Sheet 1 of 1
LOCATIO	DN ID		t Name: Meridian Work	s							rel (m AO	2.0.0	
DS30	001	-	t Number: NTE2569						Eastin	gs:		53591	4.57
		Client:	London Boroug	h of Enfield					North	ings:	1	19182	5.72
Hole Typ	e: WS	Rig:	Premier 110	Start & End Date: 28	/01/2020	E	_		Engine	eer:	DZ	Checker:	CR
Borin	T-12			Strata			-	Samp	les			In-Situ Tests	
Strike \	Well	Lavel (ni. NCR)) & [(Nickness (nt))		escription	Legend	Depth (m bgl)	Type ((Street)	From (m)	To (m)	Туре	Depth (m)	Result	Casing Depth & (Water Level)
- 43		10.25 30.25 31.44	Concrete. (Made Ground)			0.05	ESI	0.20	0.30	PID	0.20	6.2ppm	
		- 1	Dark brown black gravelly o	oarse SAND. Gravel is angular and m brick, concrete, clinker and flint.		-	01	0.60	0.80			11-52-	
		3.00	(Made Ground)			0.85	ES2 D2	0.70	0.80	PID	0.70	5.1ppm	
		9.89 9.90 9.29 9.25 9.27 9.49	Dark brown black gravelly n subangular fine coal, ash, cl	nedium SAND. Gravel is angular and inker and flint.		1.00	in.	0.90	100	SPT	1.00	N=0 (0,0/0,0,0,0)	
		part .	(Made Ground)	II decomposed black organic				224					
		- 5	material.	a decomposed black organic		-	ES3	1.50	1.60	PID	1.50	0.8ppm	
		100	(Alluvium) Very soft grey brown slight	y gravelly CLAY. Gravel is angular		2.00				SPT	2.00	N=8 (1,0/1,1,1,5)	
$\mathbf{Y}$			fine quartzite and flint. (Alluvium)			Ī							
		-	Loose to medium dense ligh	nt brown gravelly SAND. Gravel is		-	D4	2.50	2.60				
			(River Terrace Deposits)	and medium quartzite and flint.		1	ES4	2.70	2.80	PID	2.70	5.6ppm	
		7			7.5	F				SPT	3.00	N×12 (3,3/3,3,3,3)	
		6.83	Hole Term	ninated at 3.45m bgl.	70.5	3.45							
		:				-							
		-				F							
		:				-							
		-				ŀ							
		:				ŀ							
		-				ŀ							
		3				Ŀ							
		:				-							
		-				-							
		:				ŀ							
		-				ŀ							
		:				ŀ							
		-				-							
		:				-							
		-				F							
		-				Ŀ							
		:				ŀ							
		-				ŀ							
		:				ŀ							
		-				-							
		:				-							
		-				F							
	Chise	line	1		Rema	a dia							
From (m bgl)	-		Reason for Termination:		Kem	arks							
			Target strata reached										
			Groundwater Remarks:										
From (m bgl)	Water A		Groundwater strike at 2.2	20m bgl.									
J	3.45		Other Remarks:	evidence of contamination was recorded o	furing the	drilline e	period	2) Bon	ehale in	stalled	with 50m	m pipe.	NR
			rubber bung, gas tap and					1.04.5000					T L ENVIRONMENT

							_	T_	Scale		Section Contracts	Sheet 1 of 1
LOCA	ATION ID	Project	t Name: Meridian Works							el (m AO	<b>D):</b> 11.03	
חכי	3002	Project	t Number: NTE2569					Eastin	gs:		53586	7.49
D3.	3002	Client:	London Borough of Enfield					North	ings:		19180	5.52
Hole 1	Type: WS	Rig:	Premier 110 Start & End Date: 2	7/01/2020	E			Engine	eer:	DZ	Checker:	CR
Во	ring		Strata				Samp	les		- 1)	In-Situ Tests	
Strike	Well	Lavel (ni. ACR)) B. [Thickness (nt)]	Description	Legend	Depth	Type (Obtain)	From	To (m)	Type	Depth (m)	Result	Casing Depth & (Water Level)
	31 24	90.545 10.31	Asphalt.		(m bgt) 0.12	1000	(m)	25.000			interessor.	(water Level)
1		10.04	(Made Ground)	/	0.40							
		80.856 10.886 80.900	Concrete. (Made Ground)	/	0.55	ES1	0.65	0.75	PID	0.65	1.9ppm	
		90.28 (0.81)	Orangish brown gravelly medium SAND. Gravel is angular		0.75	ES2	0.80	0.95	PID	0.80	0.4ppm	
		- 2	medium and coarse brick. (Made Ground)		-	01	1.00	1.20	SPT	1.00	N=2 (1,0/1,0,1,0)	
		-	Dark brown black slightly gravelly fine and medium SAND.	1								
			Gravel is subangular to subrounded fine and medium ash,		1.60							
		3A3	clinker and brick. (Made Ground)		-	ES3	1.70	1.80	PID	1.70	1.8ppm	
- 2	30 <u>- 35</u>	107	Very loose brown grey clayey gravelly fine SAND. Gravel is		2.00				SPT	2.00	N=6 (1,0/1,2,1,2)	
	Н	1000	angular to subrounded fine and medium concrete, flint, quartzite and occasional brick.	m' m'		A(3465)	14-50	2560	1.65	A 2750 C	179000	
		- 3	(Made Ground)	34 - 34 - 34 - 34 - 34 - 34 - 34 - 34 -	-	ES4	2.40	2.60	PID	2.40	3.2ppm	
		3	Between 1.00m bgl and 2.00m bgl: Recovery 80%. Soft mottled brownish grey slightly gravelly CLAY. Gravel is	141 - 141 -		D2	2.60	2.80				
Y	$\cdot$ H $\cdot$	A10 -	angular to subrounded fine and medium brick, concrete, chalk	idei - jdei-	3.00				SPT	3.00	N×12 (2,2/3,3,3,3)	
		ines :	and quartzite.		ŧ						MAN ASSESSED	
		-	(Made Ground) Soft mottled grey brown CLAY with well decomposed black			5954	5225	4004	l cons	Upp21.5	1500 =	
		- 3	organic material.			D3	3,60	3.80	PID	3.60	2.1ppm	
		- 3	(Alluvium)  Medium dense greyish brown slightly gravelly medium SAND.						SPT	4.00	N=17 (2,3/3,4,5,5)	
		- 3	Gravel is subangular and subrounded fine and medium								2020/2020	
		4,08	quartzite and flint. (River Terrace Deposits)	100000	4.45							
			Hole Terminated at 4.45m bgl.	1								
		_			_							
		-										
		-			-							
		3										
		-										
		-										
					Ŀ							
		-										
		-			-							
		:										
					F							
		:										
		-			-							
		-										
		-			-							
					-							
		-			-							
From (m	Chise bgl) To (m		(titomen)	Rema	arks							
			Reason for Termination: Target strata reached									
			Groundwater Remarks:									
From (m	Water		Groundwater strike at 3.00m bgl.									
			Other Remarks:  1) No visual or olfactory evidence of contamination was recorded	during the	deillier	orio d	2) 0	abole in	dalled	with the		MD
			rubber bung, gas tap and stopcock cover.	auring the	arming p	eriod	zj bori	enoie int	naned	with 30th		AD
			indention and the control of the con								CONSULTANC	T L ENVIRONMENT VRE   BUILDINGS

$\overline{}$	REHO	1									1:50	<b>D</b> 1. 10.03	Sheet 1 of 1
LOC	ATION ID		STATES OF STATES OF STATES OF STATES								rel (m AO	NAME OF THE PARTY	PERSONAL PROPERTY OF THE PERSONAL PROPERTY OF
DS	3003		t Number: NTE2569	***				-	Eastin		0	53579	rod est
	- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Client							North	300		19187	
Hole '	Type: WS	Rig:	Premier 110	Start & End Date:	29/01/2020	Ĕ.	,		Engine	eer:	DZ	Checker:	CR
Вс	ring		Si	rata				Sampl	es			In-Situ Tests	
Strike	Well	Laveri (m. ACRI) & [Thirdness (m)]	Descript	ion	Legend	Depth (m bgl)	Type ((Artes)	From (m)	To (m)	Туре	Depth (m)	Result	Casing Depth 8 (Water Level)
		10.70	Concrete. (Made Ground)			0.23							
		30.33 33.40	Brown angular to rounded coarse	GRAVEL of brick, flint and	- 	0.40							
			(Made Ground)		1			2000		1.00	1,7254034	967	
		- 6	Very loose dark brown black sligh			Ŀ	ES1	0.90	1.20	PID SPT	0.90 1.00	2.2ppm N=2 (1,0/0,1,0,1)	
			SAND. Gravel is angular to subrou coal, clinker, flint, quartzite and or				01	1.30	1.70				
			(Made Ground)										
		11.70	Very soft grey CLAY with partially	decomposed brown rootlet	s	-2.00				SPT	2.00	N=4 (1,1/1,1,1,1)	
		- 3	(Alluvium)		====		ES2	2.50	2.60	PID	2.50	23ppm	
					====		02	2.70	2.90		2.30	E AGAITT	
	$\cdot $ $\square $ $\cdot $	- 2	Below 3.00m bgl: Soft.			L				SPT	3.00	N+5 (1,0/1,1,2,1)	
ϫ		3.24 D.79	Medium dense grey gravely med	ium and coarse SAND. Grav	el MASSA	3.20						6.7	
			is angular to subrounded fine and			-	03	3.50	3.60				
			(River Terrace Deposits)		7.00	-	£S3	3.70	3.80	PID	3.70	8.7ppm	
		-			(4.4.5)	F				SPT	4.00	N=18 (3,3/4,5,4,5)	
		6.48			(A)	4.45							
		- :	Hole Terminated a	t 4.45m bgl.									
		_											
		:				ŀ							
		-				ŀ							
		-				-							
						ŀ							
		- 7											
		3				Ė							
		:				ŀ							
		_				-							
						-							
		-				-							
		:				ŀ							
						F							
						-							
	Chise	sing			Rema	arke							
From (m	bgl) To (m	bgl) Time	Reason for Termination:		Nem	arka							
			Target strata reached										
			Groundwater Remarks:										
From (m	Water		Groundwater strike at 3.20m bg										
	10 (11)	-	Other Remarks:  1) No visual or olfactory evidence	e of contamination was record	ed during the	drilling	neriod	2) Bor-	ehole in	stalled	with 50m	m pine	AID
			rubber bung, gas tap and stoped					- al bou	ore HI	J. G. P. C.	200		T I ENVIRONMENT
												INFRASTRUC	TURE   BUILDINGS

001	KLIIO	LL L	70							Scale	2 1:50		Sheet 1 of 1
LOC	ATION ID	Projec	t Name: Meridian Wo	orks					Groun	ıd Lev	vel (m AO	OD): 10.93	
	2204	Projec	t Number: NTE2569						Eastin	igs:		53579	7.82
DS	3004	Client:	London Borr	ough of Enfield					North	ings:	â	19184	15.25
Hole '	Type: WS	Rig:	Premier 110	Start & End Date:	29/01/2020	E			Engine	eer:	DZ	Checker:	CR
Вс	oring			Strata	550 - 11			Sampl	es		1	In-Situ Tests	
Strike		Lavel (m. ACH); B. (Thickness (m))		Description	Legend	Depth (m.bel)	Type	From	1	Туре	Depth (m)	1	Casing Depth & (Water Level)
	3 3	li-mi	Concrete.	THE WOOD WAS TO SEE THE SECOND OF THE SECOND		(m bgt)		(m)	25.000			Literature and	(Water Lever)
		1033 3730	(Made Ground)			0.40							
		0.10		velly clayey fine SAND. Gravel is concrete, flint, clinker and brick.			£51	0.60	0.70	PID	0.60	2.5ppm	
			(Made Ground)				61	1.00	1.20	SPT	100		
			Between 1.10m bgl and 1.40	Im bgl: Slightly clayey.			D1	3.00	2.49	36.1	1.00	N=5 (1,1/1,2,1,1)	
		1	4										
		1											
		<u> </u>	Between 1.90m bgl and 2.50	lm bgl: Slightly clayey.		-	ES2	2.10	2.20	SPT	2.00	N=7 (1,1/1,3,1,2)	
			4				D2	2.30	2.50	PID	2.10	0.6ppm	
	· +:	8.85 (1.00)	Soft grey sandy gravelly (	CLAY. Sand is fine. Gravel is angular		2.50							
		1	fine flint.	25.0		1	ES3	2.70	2.90	PID	2.70	1.9ppm.	
		-	(Alluvium)  Below 3.00m bgl: Peuty.	_		-				SPT	3.00	N+5 (1,0/1,2,1,1)	
•	# 1	-24				12057							
-		E49 E294		angular to rounded fine SAND and	(4)	3.50	*****		2048	1.65	A 1875.1	150.003	
			(River Terrace Deposits)	rtaite. Sand is medium and coarse.	(4)	E	E54 D3	3.80 3.90	3.90 4.00	PID	3.80	3.1ppm N=21 (5,5/5,6,5,5)	
											-	Market State of Advances	
		1.00	Hole	Terminated at 4.45m bgl.	53253	4.45							
		_				-							
						-							
						Ŀ							
		ı ;				ŧ							
		-				-							
						-							
						ŀ							
		1				Ė							
						-							
		7				-							
						Ė							
		1											
						-							
						-							
						ŀ							
From (m	Chise bgl) To (m		e (hirumin)		Rema	arks			_	_	_		
			Reason for Termination										
			Groundwater Remark										
	Water A	Added	Groundwater strike at										
From (m			Other Remarks:										A ##
				ory evidence of contamination was record				2) Bore	ahole in:	stalled	with 50m	im pipe, B	NR
			rubber burig, gas tap a	and stopcock cover. 3) ground level estim	rated from topo	) survey						CONSULTANC	CT   ENVIRONMENT TURE   BUILDINGS

LOCATION ID	Projec	t Name: Meridian Work	s					Groun	d Lev	rel (m AO	D): 10.58	6
	Projec	t Number: NTE2569						Eastin	gs:		53574	15.88
DS3005	Client		h of Enfield					North		9	19182	The Ath
Hole Type: WS	-	Premier 110	Start & End Date:	28/01/2020	V			Engine	300	DZ	Checker:	CR
	nig.	Premier 110		28/01/2020					T			Ch.
Boring			Strata		Book		Samp				In-Situ Tests	
Strike Well	Lavel (ni. ACR)) & [(Nickness (nt))		escription	Legend	Depth (m bgl)	Type ((Alexan)	From (m)	To (m)	Туре	Depth (m)	Result	Casing Depth 8 (Water Level)
13.1.123	10.47 10.47 10.24	Asphalt. (Made Ground)		<i>-</i>	0.11							
	30.23 (0.40)	Concrete.		_	0.35	ES1	0.50	0.70	PID	0.50	45.5ppm	
	170 E-101	(Made Ground) Orangish brown gravelly fine	e and medium SAND. Gravel is	<b>-</b> /‱	0.80					1,75900	Article 1	
		angular and subangular fine	and medium brick and concrete.	· 1	L	E52	0.90	1.00	PID SPT	0.90 1.00	54.8ppm N=5 (1,1/1,2,1,1)	
	11:50 [1:50]	(Made Ground) Dark brown black gravelly sa	andy SILT. Sand is fine. Gravel is	<b>-</b>  ‱	1.10	D1 ES3	1.10	1.50	PID	1.30	41.9ppm	
		angular and subangular fine			1.60						120	
	11.00	concrete and flint. (Made Ground)		- Ju- st	ļ	02	1.70	1.80				
			ndy gravelly CLAY. Gravel is angula		-	ES4	1.90	2.00	SPT	1.90 2.00	29.7ppm N=7 (1,1/1,3,1,2)	
1.4.1		(Made Ground)	with occasional brick and concrete	- alle al	ŧ	03	2.30	2.50				
	7.00	Soft grey CLAY with black wo (Alluvium)	ell decomposed organic material.	342 - 344 - 34 - 34 - 340 - 340 - 3	2.60	D4	2.60	2.80			1000000	
		Soft black slightly clayey par	tially decomposed PEAT with	in side, sides, s	F	ESS	2.70	2.80	PIO	2.70	45ppm	
1.17.	-	occasional angular fine flint (Alluvium)		عاد بناد د ماد بناد د	-				-SPT	3.00	N+5 (1,0/1,2,1,1)	
	, m	1511455	e - S et de de	عاد خاد . عاد عاد	3.45							
		Hole Term	inated at 3.45m bgl									
Chise				Rema	arks	1		1	1		L	
From (m bgl)   To (m   Water   From (m bgl)   To (m   bgl)   To	Added	Reason for Termination: Target strata reached Groundwater Remarks: No groundwater encount tume (0) Other Remarks:	ered.		245			70,00	2000	T- 1127424	DI	AID
			evidence of contamination was record stopcock cover.	ed during the	drilling	period	, 2) Bor	ehole in	stalled	with 50m	CONSULTANC	NE

501	KEHU	LE LU	<i>J</i> G							Scale	2 1:50		Sheet 1 of 1
LOCA	ATION ID	Projec	t Name: Meridian Works						Groun	d Lev	vel (m AO	<b>DD):</b> 10.80	ii .
DS.	3006	Projec	t Number: NTE2569						Eastin	gs:		53583	9.11
D3.	3000	Client:	t ondon Borough o	of Enfield					North	ings:	á	19178	7.86
Hole T	Type: WS	Rig:	Premier 110	Start & End Date: 2	7/01/2020	).			Engine	eer:	DZ	Checker:	CR
Во	oring			Strata			1	Sampl	es		y.	In-Situ Tests	
Strike	Well	Lavel (ni. ACR)) B. (Thirdness (ni.))		cription	Legend	(im ofb)	Type (Oldowe)	From (m)	To (m)	Туре	Depth (m)	Result	Casing Depth & (Water Level)
		30.69 30.69 30.50	Asphalt. (Made Ground)			0.11						27230	
		10.20	Concrete.			0.55	651	0.35	0.45	PID	0.35	8.1ppm	
		31.64	(Made Ground) Multicolored (orange, brown, y	yellow and grey) gravelly fine	J		ESZ	080	0.90	PID	0.80	3.5ppm	
		-	and medium SAND with low co	obble content. Gravel is angular um brick, ash, flint and concrete.		-	D1	1.00	1.20	SPT	1.00	N=5 (1,0/2,1,1,1)	
		1	Cobbles are angular brick.	an ones, ash, min and someway		ł							
		18	(Made Ground) Loose brown slightly clayey ang	gular to rounded fine and		1.50	02	1.60	1.70				
				, concrete and occasional chalk.			ES3	1.60	1.90	PID SPT	1.80	1.1ppm	
		Street -	Soft brown gravelly CLAY with o		EE	2.00	1243	200		561	2.00	N=3 (1,0/1,0,1,1)	
		3	Gravel is angular to subrounde concrete and chalk.	ed fine and medium brick, coal,	===	1	D3 ES4	2.50	2.40	PID	2.50	0.2ppm	
		1	(Made Ground)	M.A		ł						100	
	$\cdot$ $+$ $\cdot$	180 -	Very soft grey CLAY with black (Alluvium)			3.00				SPT	3.00	N+20 (3,4/5,5,5,5)	
			Medium dense brownish grey : medium GRAVEL. Sand is fine a	sandy subrounded and rounded and medium.		-							
		136	(River Terrace Deposits)		/	3.45							
		3	Hole Terminat	ted at 3.45m bgl.		E							
		7				F							
		1				-							
		,				F							
						Ŀ							
		ţ				ŀ							
		£				-							
						F							
		7				ŀ							
		ţ				ŧ							
		+				-							
						F							
		7				-							
		ţ				Ė							
		}				F							
		_1				Ŀ							
						ŧ							
		ţ				-							
						F							
		۲				F							
						ŧ							
		7				F							
From (m)	Chise bgl) Yo (m		e (Niturum) Reason for Termination:		Rema	arks							
			Target strata reached										
			Groundwater Remarks:										
_	Water A	Added	No groundwater encountere	ed.									
From (m.)			Other Remarks:										A 1150
			<ol> <li>No visual or olfactory evid rubber bung, gas tap and sto</li> </ol>	dence of contamination was recorded	during the	drilling p	period	2) Bore	ehole ins	stalled	with 50m	m pipe,	NR
			rubber burig, gas tap and sto	pcock cover.								CONSULTANC	THE LEWISONMENT

BOREHOLE No GI\_DZ4\_BH1001

Client:

### **London Borough of Enfield**

Project No: Ground Level: Co-ordinates: 25/07/2018 409.05569.00004 11,32m

E535523 N191640



Project:

		SAM	PLES & TESTS	9						STRATA				ent
Depth	Type No	Test Type	Test Result		N Value 0 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)		DESC	RIPTION		Instrument
.20	ES	нѕ	22 ppm				2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		(0.90)	Gray slightly cli Gravel is angul brick, concrete (MADE GROUN	r to subri and flint.	elly fine to coars ounded fine to c	e SAND. oarse	
	]	HS	9 ppm				10.42		0.90	080 Becomes	dayey.			
	2													
	Paring I		and Water Of	remetion		1		licalling.		Water Ad	fod	Cana	ral Remarks	
Date	Time	Depth	and Water Ob Casing Dpt	1	-	╢.	From	niselling To	Hours	From From	To	1. Inspection		
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								132775	10000		Terminated of obstruction. arisings.	lue to conc	rete
All dime	nsions in	metres	Contracto	r: HGE L	td :		Method	: Cable p	ercussion (	shell and auge	0	Logged By:	Approve	ed B
S	cale 1:40		Plant: Ha	and Excava	sted		Hole Siz	e: 300m	m	10.0	16	G. Pursey	FC	2

BOREHOLE No GI\_DZ4\_BH1001A

Client:

### **London Borough of Enfield**

Project No: Ground Level: Co-ordinates: 409.05569.00004 25/07/2018 11,32m E535523 N191637

Project:

		SAM	PLES & TESTS							STRATA			aut
Depth	Type No	Test Type	Test Result	SPT N 10 20	Value 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)	DES	CRIPTION		Instrument
S	-	110							11000	Concrete hardstanding (MADE GROUND)	ı.		
	8	HS	2 ppm				10.92		0.40				
.50	D									Brown slightly sandy g			1
-	7.563									subangular rounded fi brick, concrete and gla			
.80	ES	HS	11 ppm						(0.80)	(MADE GROUND)			
.00 1-	D												
-							10.12		1.20	Dark brown mottled b	lack slightly sandy	clavev	ł
-		· corr								angular to rounded fir	e to coarse GRAVE	L of flint	
- 5	7.81	SPT	N=14 2 ppm	14					(0.80)	brick, concrete, timbe occasional black staini			
	ĺ	9855	975-9V							Cobbles are subangula fine to coarse.	r brick and concre	te. Sand is	
.00 2-	D						9.32		2.00	(MADE GROUND)		Į.	
10	ES	HS	34 ppm				3			1.20 Slight hydrocarbo Dark brown mottled g		ultv /	
				1					(0.60)	gravelly fine to coarse	SAND with occasio	nal	
	9	SPT	N=10	<b>1</b> 0			8.72		2.60	pockets of ash and bla to subrounded fine to			
		HS	3 ppm				2			and concrete.		1	•
	ğ.,						3			(MADE GROUND) 200 Slight hydrocarbo	n odour.		
1.00 3-	В						-		(0.90)	Firm locally soft dark g brown slightly sandy s			
3							1 8			with rare relict rootlet	s. Gravel is subrou	nded fine	
.40 -	ES	HS	2 ppm	1			7.82		3.50	to medium brick. Sand (MADE GROUND)	is fine to medium	-	
		SPT	N=5	٣,				AT X		Soft dark brown mottl			
- 2		HS	0 ppm				1 8	X		sandy silty CLAY with a rootlets. Sand is fine t		and relict	
1.00 4-	D						8	X	(0.70)	(ENFIELD SILT)		10.11	
3							7.12	X	4.20	<b>-</b>	2101F0FL0GC0.DFHCFE		
		HS	12 ppm				8			Medium dense brown subrounded to rounde			F
1.50 - 4.95 -	В	SPT	N=23	<b>D</b> 2	3	b				flint. Sand is fine to co	arse.		
- 3									(0.80)	(KEMPTON PARK GRA) 4.20 Slight hydrocarbo		1	1
-							6.32	357	5.00	4.35 No longer clayey.	and the second	į.	
5-			i				0.02		3.00	4.90 Becomes very sai Medium dense brown		lly fine to	
							1 3			coarse SAND. Gravel is fine to medium flint.	subrounded to ro	unded	
5.50 -	В	SPT	N=20	4			1 8			(KEMPTON PARK GRA			
5.50 - 5.95	EW	HS	50 ppm	7."						5 00 Slight hydrocarbo	n odour.	i	
9				\			2					9	
6-												- 0	
	Rorina I	rnarecs	and Water O	hservations				niselling	1	Rosehole Cor Water Added	Gener	al Remarks	_
	Time	Depth			Water Dpt	-	rom	То	Hours	From To	1. Inspection		-
	(100 (100))	a spill	and all	THE WIND	Transporter	1	o-fores	- 3.50	1,388(8)	4.00 5.00	Environment	al seal plac	
										20000	from 3.0m to Completed to		
											Installed with	50mm sta	andpi
											for groundwa	ster and ga	5
											monitoring.		
ATE	* h h h - T - T	~ دنمندید					100000000000000000000000000000000000000	- W-1/	www	A la all au a sanca a la	100000000000000000000000000000000000000	I Table 1	
. All dimens		metres		or: HGE Ltd	/Dando 200	10		- 0		(shell and auger)	Logged By:	Approve	
Sca	ie 1:40		Plant: 1	and Excavated	/Dando 200	Ю.	Hole Siz	e: 150m	m	, l	G. Pursey	FC	2

BOREHOLE No GI\_DZ4\_BH1001A

Client:

### London Borough of Enfield

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 25/07/2018 11.32m E535523 N19

o-ordinates: E535523 N191637



Project:

**IKEA Clear GI** 

2 - 6 2

		SAM	PLES & TEST:	S						STRA	TA			ent
Depth	Type No	Test Type	Test Result	SPT N \	/alue 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)		DESC	CRIPTION		Instrument
7.00 - 7.45 7-	В	HS SPT	46 ppm N=38		38				(3.00)		mes dense.			
3.00 8-	D	HS	0 ppm				3.32	x x	8.00	Firm locally silty CLAY v	vith occasion	ownish grey sligh al selenite crystal e siltstone fine gr	is and	
3.50 - 8.95	UT	HS U	0 ppm 65					X-X-X		is fine. (LONDON C	CLAY)			
9.00 9- -	D							X	(2.00)	] 900 Becor	nes stiff and i	no langer slightly s	andy.	
		HS	0 ppm					X						
0.00 - 10- 0.45	D	SPT	N=18	18			1.32	N-X-	10.00		Borehole Cor	mplete at 10.00m	8	
11-								20 -1 -1						
	Boring F	rogress	and Water O	bservations			Ch	iselling		Water	Added	Gener	al Remarks	
Date	Boring Progress and Water Observations  Time Depth Casing Dpt Casing Dia Water D					Fr	om	То	Hours	From 4.00	To 5.00	Inspection     Environment     from 3.0m to     Completed to     Installed with     for groundwa     monitoring.	al seal place 4.0m. 3. 10.0m 4. 50mm sta	ed
All dimens	sions in ile 1:40	metres		or: HGE Ltd and Excavated	/Dando 2000	0		: Cable p e: 150m		shell and a	uger)	Logged By: G. Pursey	Approve FC	

BOREHOLE No GI\_DZ4\_BH1002

Client:

### **London Borough of Enfield**

Project No: Ground Level: Co-ordinates: 409.05569.00004 02/08/2018 10.01m E535650 N191673

Project:

			.,					_						_
			SAM	PLES & TESTS			-				STRATA			ent
Depth		Type No	Test Type	Test Result	SPT N 10 20	Value 30 40	Water	Reduce Level	Legend	Depth (Thick- ness)	Di	ESCRIPTION		Instrument
0.40		ES	нѕ	1 ppm				9.51	-	(0.50)		ar fine to coarse etal and flint.	brick,	
1.00	1-	D ES	HS	1 ppm						(1.00)	Very soft slightly gra angular to subround and concrete. Sand i (MADE GROUND)	ed fine to coars	flint, brick	ı
			HS SPT	1 ppm N=9	• 9			8.51		1.50				ı
	-								X	(0.50)	Soft dark grey mottle silty CLAY with occase fine to medium. (ENFIELD SILT)			ı
2.00	2-	D ES	HS	0 ppm				8.01		2.00	Soft to firm light gre- slightly sandy slightly subangular to subro	gravelly CLAY.	Gravel is	1
			SPT HS	N=13 0 ppm	13					(1.30)	Sand is fine to media (ENFIELD SILT)			ı
3.00	3-	D	HS HS	0 ppm 0 ppm				AT 22						ı
3.30	-	D	HS	9 ppm			•	6.71	22.2	3.30	Medium dense light	grey slightly gra	velly clavey	-
3.30		D HS 9 ppm EW SPT N=17 B HS 8 ppm	17		Lsz	6.51		3.50	fragments. Gravel is medium flint. (KEMPTON PARK GR	angular to suba AVEL)	ngular fine and			
4.00	4-	В	HS	8 ppm							Medium dense grey SAND and GRAVEL. ( fine and medium flir (KEMPTON PARK GR	Gravel is angular it. Sand is fine to	to subangular	
5.00	5-	D	SPT	N=21	21					(3.30)				
			SPT	N=28		28								
5.00	6-	D	HS	0 ppm				- 8	1			NU-782 - 1802	I	1
	В	oring F	rogress	and Water Ob	servations			(	hiselling		Water Added	G	eneral Remar	ks
Date	1	îme	Depth	Casing Dpt	Casing Dia	Water Dpt	F	rom	То	Hours	From To	Environm from 2.0 Complete Installed	tion pit to 1.2 eental seal pla m to 3.0m. 3 ed to 8.0m 4. 50mm standpater and gas	iced
All din	mensi	ons in	metres	Contractor	: HGE Ltd			Metho	d: Cable s	percussion	(shell and auger)	monitori Logged B		ved 8
	Scale 1:40 Plant: Dando 2000/Hand Excava								ze: 200n	nm		J. Blyth	F	C

BOREHOLE No GI\_DZ4\_BH1002

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 02/08/2018 10.01m E535650 N191673

**SLR** 

Project:

		SAME	PLES & TEST	S				-					STRA	TA			ent
Depth	Type No	Test Type	Test Result	10	SPT N		Je 40	Water	Reduced Level	Lege	nd	Depth (Thick- ness)		DES	SCRIPTION	2	Instrument
.80 .00 - 7.45	1	HS U	0 ppm 75						3.21	经经验 二二		6.80	SAND and fine and m (KEMPTON	GRAVEL. Gr. iedium flint. i PARK GRAV andy CLAY. S	ightly clayey slight avel is angular to s Sand is fine to coa VEL) Sand is fine to med	ubangular arse.	
50 50 - 7.95	D	SPT	N=22		•	22											
	8-								2.01	-		8.00		Borehole C	omplete at 8.00m		
1	1-	Progress a	and Water C	Observa	tions					hisellir	ng.		Wate	r Added	Gene	al Remark:	
Date	Time	Depth	Casing D	t Casi	ng Dia	w	ater Dpt	F	rom	То	T	Hours	From	То	1. Inspection		
															Environment from 2.0m to Completed to Installed 50m groundwater monitoring.	3.0m. 3. 0 8.0m. 4. nm standpi	
	nsions in	metres	Contract Plant: (				Excavate	ed ed	Method Hole Si			ercussion (	shell and a	luger)	Logged By: J. Blyth	Approve	

BOREHOLE No GI\_DZ4\_BH1003

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 23/07/2018 10.09m E535674 N191671

**SLR** 

Project:

**IKEA Clear GI** 

1 of 3

INCA	Clear	J.											1 of 3	
		SAM	PLES & TESTS							STRA	TA		-	ent
Depth	Type No	Test Type	Test Result	SPT N 1	Value 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)		DESC	RIPTION		Instrument
3				i i			9.89		0.20	Concrete h	ardstanding. DUND)			
0.50	D ES	HS HS	0 ppm 0 ppm				9.54		0.55	Dark grey s fine to coar pockets of (MADE GRO	lightly sandy rse GRAVEL o ash, Sand is f DUND)	silty angular to s f concrete with o ine to coarse. ebar present in co	ccasional	
.00 1-	D	HS	0 ppm							sandy sligh to rounded glass and ra	tly gravelly si fine to coars are clinker sa	rangish brown sl Ity CLAY. Gravel is e brick, flint, con nd wood fragmen	angular crete,	
.50 - 1.95	D	SPT	N=S	s					(1.75)		nes slightly gr	V.,		I
.90 - 2-	ES	HS	0 ppm								Band of clink nes very soft i	er. with slight organic	odour.	
.30 -	D	HS	0 ppm				7,79	2000 2000	2.30		rm slightly gr	aveily clayey amo	orphous	ı
.40 - .50 - 2.95	ES D	HS SPT	0 ppm N=17	12		~	7.59	i, , shi, , shi	2.50	PEAT with f		t rootlets. Gravel		Į
			DANA				7.29		2.80	(ENFIELD S	ILT) soft dark gre	eyish brown silty sed to rounded fi		Į
.50 - 3.95	B SPT N=25		25					mottled wit subrounde	ILT) ense to dense hite slightly si d to rounded	dark brownish g Ity slightly sandy fine to coarse Gi	arrange I			
.00 4-	EW										is fine to coar PARK GRAVE		9	
.50 - 4.95 - - - - -	В	SPT HS	N=28 1 ppm	lu -	28			x * . x x * . x x * . x x * . x	(4.30)					
5.50 - 5.95 - - -	В	SPT	N=31		31									
						1_		X 1				Wed on Next Page		
	2		and Water Obs		Water Dpt	١,	rom	niselling To	Hours	From	Added	1. Inspection	al Remarks pit to 1.2m	-
Date	Time Depth Casing Dpt Casing Dia Wate							10	nours	3.00	4.00	Environment between 250 Completed to Installed 50m groundwater monitoring.	al seal place m to 1.8m. o 16.5m 4. nm standpip	3.
	All dimensions in metres Contractor: HGE Ltd Scale 1:40 Plant: Cando 2000/Hand Excavat							: Cable p		(shell and a	uger)	Logged By: G. Pursey	Approve	

BOREHOLE No GI\_DZ4\_BH1003

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 23/07/2018 10.09m E535674 N191671

**SLR** 

Project:

**IKEA Clear GI** 

200

		SAM	PLES & TESTS							STRA	TA		#
5 141 50	*****					Water	not cond		Depth	5,1,11	979	and the same	mer mer
Depth	Type No	Test Type	Test Result	SPT N 10 20	Value 30 40	×	Reduced Level	Legend			DESC	CRIPTION	Instrument
7-	2000	SPT	N=16	<b>•</b> 16			2.99		7.16	mottled wi subrounde flint. Sand (KEMPTON	hite slightly s od to rounder is fine to coa I PARK GRAV	EL)	RAVEL of
.50	D	HS	2 ppm							CLAY with	rare fine sele	sandy slightly gra- nite. Gravel is sul lium flint. Sand is	brounded
8-		HS	1 ppm							fiagments 800 Occa	mes fissured of and no furth assignal lenses	with accasional sh er gravel of flint p of fine white selen	resent.
.50 - 8.95 - .50 - 8.95	B UT	U	60							850 Beco		frequent partings ent shell fragment	
.00 - 9.45 9-	D	SPT	N=21	21				X					
-		нѕ	0 ppm						(8.90)				
0.50 0.95	υT	HS U	0 ppm 100										
2.00 12- 2.45	D	SPT HS	N=26 0 ppm		26			* * * * * * * * * * * * * * * * * * *					
	Boring I	Progress	and Water Ob	servations				niselling	1		Added	Gene	ral Remarks
	Time	Depth		Casing Dia	Water Dpt	F	rom	То	Hours	From	To		pit to 1.2m.
									and St.	3.00	4.00	Environment between 2.8 Completed t	tal seal placed im to 1.8m. 3. o 16.5m 4. nm standpipe
All dimens	ions in	metres	Contractor Plant: Da	: HGE Ltd	and Everyunte	<u>                                     </u>		: Cable p		(shell and a	uger)	Logged By: G. Pursey	Approved 6

BOREHOLE No GI\_DZ4\_BH1003

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates:

409.05569.00004 23/07/2018 10.09m E535674 N191671



Project:

**IKEA Clear GI** 

3 of 3

			SAM	PLES & TESTS	0						STRA	TA		+
Docth		Туре	Test	Test		Meline	Water	Reduced	Legand	Depth (Thick-	31100	25 P. Contract	CRIPTION	Instrument
3.50 - 3.95 4.00 5.00 - 5.45 6.00 - 6.45 6.00 - 6.45	13-14-15-15-117-118-	Type No  UT  D	Test Type  U  SPT HS	N=28 0 ppm	SPT N 10 20	Value 30 40	eW.	-5.91 -6.11	Legend ** The second se		Dense dari to coarse S (LAMBETH	omes slightly s greyish bro AND. GROUP) ght bluish gr	ey mottled reddis	silty fine
	В	oring l	Progress	and Water Ot	servations		Ī	C	hiselling	-	Water	Added	Gener	ral Remarks
Date	Т	ime	Depth	Casing Dpt	Casing Dia	Water Dpt		From	То	Hours	From	То	1. Inspection Environment	
											3.00	4.00	between 2.8 Completed to Installed 50n groundwater monitoring.	m to 1.8m, 3. o 16.5m 4. nm standpipe
		ions in e 1:40	metres		r: HGE Ltd ando 2000/H	and Excavate	JL_		d: Cable p		(shell and a	uger)	Logged By: G. Pursey	Approved FC

BOREHOLE No GI\_DZ4\_BH1004

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 02/08/2018 12.02m E535542 N191573

SLR

Project:

IKEA Clear GI

		SAM	PLES & TESTS			-				STRAT	A		t
Depth	Type No	Test Type	Test Result		Value 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)		DES	CRIPTION	1000
0.50 0.50 - 1.00 0.70	B D ES	HS HS	2 ppm 2 ppm						(1.80)	cooble cont fine to coar	ent. Gravel se concrete netal. Cobb	to coarse SAND w is angular to suba s, brick, flint and p ales are subangula	ith high ngular lastic with
1.50 - 2.00	В	SPT HS	N=8 5 ppm	•			10.22		1.86				
2.00 2-	ES	HS	44 ppm				-		(0.70)	Soft dark gr CLAY. Grave brick, concr (MADE GRO	l is angular ete, clinker		
2.50 - 3.00	В	SPT HS	N=9 22 ppm	•,			9.52		2.50	Black slight with occasion grey sandy	onal pocket clay and silt	layey fine to coars is of light brown m t. Gravel is angular	ottled to
3.00 3-	ES	HS	17 ppm						(1.20)	and flint. (MADE GRO		rse brick, concrete n odour.	, clinker
1.50 - 4.00 1.70 - 4.10	В	SPT HS HS	N=12 9 ppm 65 ppm	12			8.32		3.76			ahah alaus allaha	
4		HS	7 ppm				8.02		4.00	SAND and G subrounded coarse. (RIVER TERI	RAVEL. Gra I fine to coa		ine to
1.50 - 4.95 S	0-4.95 - D SPT N=48 HS 5 ppm			<i>\rightarrow</i>	4 8			(1.80)	Soft to firm gravelly san	dark grey r dy CLAY. Gr I fine to co:	on odour and sheer mottled brown slig avel is angular to arse flint. Sand is fi	htly	
.50 - 5.95	D	SPT	N=6	ľ			6.22		5.80		nse grev sli	ghtly clayey slight	v siltv .
5.00	EW	HS	61 ppm	1		1	-	4 -		51	LORDON DE PRE	tinued on Next Page	- 10
	Boring I	Progress	and Water Ob:	servations		╁	Ch	iselling			Added		al Remarks
Date	Time	Depth	1 DW 9 2	Casing Dia	Water Dpt	-	rom	То	Hours	From	То	1. Inspection	01121022002
							1.80	2.00	01:15		- 200	Environment from 2.7m to Completed to Installed 100 groundwater monitoring a collecting DN	3.7m. 3. 9.8m. 4. mm standpip and gas nd sump for
	All dimensions in metres Contractor: HGE Ltd Scale 1:40 Plant: Hand Excavated/Dando 2							: Cable p		(shell and au	iger)	Logged By: J. Blyth	Approved FC

BOREHOLE No GI\_DZ4\_BH1004

Client:

### London Borough of Enfield

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 02/08/2018 12.02m E535542 N191573

**SLR** 

Project:

**IKEA Clear GI** 

2 of 2

		SAMI	PLES & TESTS			uged				STRAT	A		ŧ
Depth	Type No	Test Type	Test Result	SPTN		Water	Reduced Level	Legend			District.	CRIPTION	Instrument
7.00 - 7.50 7- 8- 8- 3.50 - 9.00 3.70	B B B	SPT HS HS HS	N=16 9 ppm 4 ppm 1 ppm N=18 1 ppm	10 20 3	30 40		3.32		(2.90) (2.90) (1.10)	subrounded coarse. (KEMPTON 5.80 Strong Stro	PARK GRAV PARK GRAV phydrocurbe ghtly sandy e and partir LAY)	avel is angular to arse flint. Sand is fi (EL) on odour and sheen y silty CLAY with or ngs of silt. Sand is to omplete at 9.80m	ine to
	Boring F	rogress a	and Water Ob	servations			Cl	niselling		Water	Added	Gener	ral Remarks
Establish Total	Time Depth Casing Opt Casing Dia Water						rom 1.80	To 2.00	Hours 01:15	From	То	Environment from 2.7m to Completed to	o 9.8m. 4. mm standpipe and gas nd sump for
All dimens	ions in	metres	Contractor Plant: Ha	: HGE Ltd	/n i - 200	<u></u>	100000000000000000000000000000000000000	: Cable ; e: 150r		(shell and au	iger)	Logged By: J. Blyth	Approved E

BOREHOLE No GI\_DZ4\_BH1005

Client:

### **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 01/08/2018 12.32m E535595 N191573

SLR

Project:

IKEA Clear GI

......

		SAM	PLES & TESTS									STRAT	A			ent
Depth	Type No	Test Type	Test Result		PT N 20	Valu		Water	Reduced Level	Legend	Depth (Thick- ness)		DESC	CRIPTION	7.	Instrument
0.50	D	нѕ	35 ppm						11.52		(0.80)	cooble cont fine to coar Cobbles are (MADE GRO	ent. Gravel se concrete, subangular DUND)		engular i flint.	
1.00	1- D	нѕ	188 ppm								(1.20)	with occasi clay and asi	onal pockets h. Gravel is a oncrete, bric	velly fine to coan of soft yellowish ingular to subrou k and clinker.	brown	
.50	ES	SPT HS	N=13 43 ppm		13											ı
.00	2- D	HS	67 ppm	_ \	4				10.32		2.00					ı
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		\							(MADE GRO	ardstanding. DUND)			ı
	1				1				9.92		2.40					ı
	:	SPT	N=21		2	1						to coarse b (MADE GRO	D. Gravel is rick, concret	ghtly clayey grave angular to subrou e, flint and clinke odour.	inded fine	
.00	3- D	HS	42 ppm								(1.60)					ı
		SPT	N=15	•	15											ı
00	Ε.								8.32		4.00		and the second transfer			
3.00	4- D								7.92		4.40	(MADE GRO	ardstanding. DUND)	2000		ı
		SPT	N=12	1.	2							CLAY. Grave coarse flint medium.	l is angular t and relict w	grey slightly grav to subrounded fir ood. Sand is fine	ne to	ı
.00	5- D ES	HS	14 ppm					ľ			()		rate hydroca	rbon odour.		
5.90	ES B	HS HS	429 ppm 159 ppm					\sqrt{z}	6.82		5.50	Medium de SAND and 0 subrounded coarse.	RAVEL Gra	thtly clayey slight vel is angular to rse flint. Sand is f EL)	Si Si U	
	Desire	200000	and Mary 199		-			1	1 24	death			DO NOT THE RESERVE	Good	est Daniel	
Det-			and Water Ob:		_	T.,	laka- F	-	- 1	riselling	N		Added		ral Remarks	_
Date	Time	Depth	Casing Dpt	Casin	g Dia	W	Vater Dpt		100000000000000000000000000000000000000	To 2.40 4.40	01:00 01:00	5.50	To 6.00	Inspection     Environment     from 4.0m to     Completed to     Installed 100     groundwater     monitoring a     collecting DN	al seal place 5.0m. 3. 0.9.0m. 4. Imm standp and gas and sump fo	ed sipe
	nsions in		Contractor Plant: Da			Hann	d Evravat	l ha	Method Hole Siz			(shell and a	iger)	Logged By: J. Blyth	Approve	

BOREHOLE No GI\_DZ4\_BH1005

Client:

# **London Borough of Enfield**

Project No: Ground Level: Co-ordinates:

409.05569.00004 01/08/2018 E535595 N191573 12,32m

Project:

IKEA Clear GI

			SAME	LES & TESTS	g.				-				STRA	TA			ent
Depth		Type No	Test Type	Test Result	SP 10 2		Valu	ie 40	Water	Reduced Level	Legend	Depth (Thick- ness)		DES	CRIPTION		- Instrument
7.15	7	EW	SPT	N=20		20						(2.30)	550 Stron	g hydrocarbo	on adour and sheen	o in water.	
	1									4.52		7.80		ightly gravel	lly sandy silty CLA	V Graval is	
.00	8-	D	нѕ	2 ppm							and the second		angular to		fine to coarse flir		П
	3									4.12		8.20	(LONDON C				
.50 - 8.9	5	UT	U	70								(0.80)		e. Sand is fir	silty CLAY with or ne.	casional	
9.00	9-	D	HS	2 ppm						3.32		9.00			omplete at 9.00m		577
	10-																
	12- B	oring F	Progress a	and Water Ob	servation	15				C	hiselling		Water	Added	Gene	ral Remarks	
Date	7	ime	Depth	Casing Dpt	Casing I	Dia	w	ater Dpt	-	rom	То	Hours	From	То	1. Inspection Environment		
										2.00 4.00	2.40 4.40	01:00 01:00	5.50	6.00	from 4.0m to Completed t Installed 100 groundwater monitoring a collecting DN	5.0m. 3. o 9.0m 4. Imm standpi and gas and sump for	pe f
	<u> </u>			Contracto	r: HGE L	td :	_			Method	f: Cable r	percussion	(shell and a	uger)	Logged By:	Approved	d By
All din	nensi	ons in	metres	Contracto												- delevere	a cry

BOREHOLE No GI\_DZ4\_BH1006

Client:

# **London Borough of Enfield**

Project No: Ground Level: Co-ordinates: 409.05569.00004 01/08/2018 E535529 N191540 11,37m

		SAM	PLES & TEST	5		gel				STRATA	4			Ħ
Depth	Type No	Test Type	Test Result	SPT N \	/alue 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)	55-11111	DES	CRIPTION		Instrument
0.50 0.50 -	B D	нѕ	0 ppm						(1.50)	subangular f concrete, flir content. Cob fine to coars (MADE GRO	ine to coar nt and clink obles are su e. UND)	very sandy angula se GRAVEL of brick ter with high cobb abangular concret orbon odour.	k, le	
.00 1-	D	HS	2 ppm											ı
1.50 - 2.00	В	SPT HS	N=50 0 ppm		/	so	9.87		1.50	Dark grey m to coarse SA	ND with fro	k slightly gravelly equent pockets of prounded fine to c	ash.	1
2-		HS	0 ppm							brick, concre (MADE GRO 150 Moder	UND)	d clinker. orbon adaur.		ı
2.50 - 3.00	В	SPT HS	N=32 2 ppm		912				£2.700	2.50 Becom ash present		layey and gravelly	with no	ı
3-		HS	6 ppm						(2.70)					ı
3.50 - 4.00	B ES	SPT HS	N=19 1 ppm	19										ı
4-	В	HS	2 ppm			•	7.17		4.20	+	laha asas s	nottled orangish b		ı
1.50 - 4.95	UT	U	15				6.57		(0.60)	slightly sand	y slightly g to subround to medium	ravelly silty CLAY, ded fine to coarse	Gravel is	ı
4.88 - 4.93 5-	D	HS	2 ppm				6.17	X	5.20	Soft to firm of sandy silty C	hydrocarboi dark grey n LAY. Sand i T)	nottled light grey s fine to medium.	slightly	
5.50 - 6.00	В	SPT HS	N=15 6 ppm	15							clayey slig RAVEL. Gra fine to coa ARK GRAV	htly silty fine to co wel is angular to irse flint. EL)	parse	
5.00 6-	ES	HS	7 ppm			SZ	-			J 320 Strong	nyarotaro	ni occur.		
	Boring P	rogress	and Water C	Observations			Ch	iselling		Water		Gener	al Remark	S
Date 1	lime	Depth	Casing D <sub>f</sub>	ot Casing Dia	Water Dpt	F	rom	То	Hours	From	То	Inspection     Environment     from 3.7m to     Completed to     Installed 100     groundwater     monitoring a     collecting DN	al seal pla 4.7m. 3. 9.2m. 4. mm stand and gas nd sump f	ced pipe
All dimens	ions in i	metres		or: HGE Ltd Cando 2000/Ha		_		: Cable p		(shell and au	ger)	Logged By: J. Blyth	Approv	

BOREHOLE No GI\_DZ4\_BH1006

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates:

409.05569.00004 01/08/2018 11.37m E535529 N191540

SLR

Sheet

Project:

**IKEA Clear GI** 

		CALO	PLES & TESTS	7		$\overline{}$				STRA	TA			44
		SAM	LES & TESTS	<u></u>		ter		-	Depth	SIKA	IA.			neu.
Depth	Type No	Test Type	Test Result	SPT N 10 20	Value 30 40	Water	Reduced Level	Legend			DES	CRIPTION		Instrument
6.50 7.00 - 7.50 7	EW B	SPT HS	N=18 2 ppm	18					(3.00)	SAND and subrounde			parse	
8.20	- - - -						3.17		8.20					
8.50 - 8.95 8.61 - 8.66	ES UT	HS SPT U	7 ppm N=28 45		28				(1.00)		te. Sand is fin	silty CLAY with oc	casional	I
9		HS	7 ppm				2.17		9.20					ı
	1		0.3000			1	2.27		3.20		Borehole Co	mplete at 9.20m		Г
11			- 22										8	
	Boring F	rogress a	and Water Ob	servations			C	niselling		Water	Added	Gener	al Remarks	ķ
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	F	From	То	Hours	From	То	1. Inspection Environment from 3.7m to Completed to Installed 100 groundwater monitoring a collecting DN	al seal place 4.7m. 3. 9.2m. 4. mm stands and gas and sump fo	ed
All dimer	nsions in ale 1:40	metres		: HGE Ltd	and Excavate	ed		: Cable p		(shell and a	uger)	Logged By: J. Blyth	Approve	
Sc	ale 1:40		Plant: Ca	ndo 2000/Ha	and Excavate	ed	Hole Siz	e: 150m	ım			J. Blyth	FC	2

BOREHOLE No GI\_DZ4\_BH1007

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 26/07/2018 12.08m E535589 N191508

**SLR** 

Project:

**IKEA Clear GI** 

1 of 3

1,0000	A Clear	٠.									1 of 3
		SAN	IPLES & TESTS	}	-				STRATA		ent
Depth	Type No	Test Type	Test Result	SPT N Value 10 20 30 40	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIP	TION	Instrument
0.50	D	HS	0 ppm	10 20 30 40		11.48		(0.60) - 0.60	Grey slightly silty gravelly fit occasional rootlets. Gravel i fine to coarse concrete, brid (MADE GROUND)	s angular to s k, flint and pl	AND with ubangular astic.
1.00	1- D	HS	0 ppm					(0.70)	Dark grey occasionally mott clayey gravelly fine to coars angular to subangular fine t brick, flint and plastic. (MADE GROUND)	SAND, Grav	el is
2.00	2- D	HS SPT	0 ppm N=21	21		10.78		(1.40)	Dark grey slightly sandy slig with occasional pockets of c SAND. Gravel is angular to s coarse brick, flint, concrete to coarse. (MADE GROUND) 1.40 Cloth material. 1.90 Occasionally mottled in present. 2.00 Occasional wood fraga	layey fine to ubangular fin and clinker. S rown with no	coarse e to and is fine
	1			T.		9.38		2.70	Concrete hardstanding.		-
3.00	3 D					9.08		3.00	(MADE GROUND)  Dark grey slightly clayey slig	htly gravelly i	fine to
	}					8.78		3.30	coarse SAND with frequent	pockets of as	h, Gravel
3.50	ES					3		(0.90)	(MADE GROUND)  300 Strong hydrocarbon od  Dark grey mottled reddish b slightly gravelly fine to coan pockets of ash and low cobi	rown slightly se SAND with	frequent
4.00	4 □ □					7.88		4.20	angular to subangular fine t concrete and clinker. Cobble (MADE GROUND)	o coarse brici es are subang	k, flint,
4.50 4.50 4.50 - 4.95	ES UT	HS U	395 ppm 20			7.48	316 - 100 A	4.60	3.30 Strong hydrocarbon od Soft to firm grey mottled ye with rare rootlets and occas lenses.	llowish brown	
5.50 - 5.95 5.90 6.00	D ES EW	SPT HS	N=16 335 ppm	<b>•</b> 16				(2.30)	(ENFIELD SILT)  1 420 Slight hydracarbon odd Solt to firm dark grey mottl slightly gravelly silty CLAY w wood and rootlets. Gravel is fire to coarse flint. Sand is f (ENFIELD SILT)	ed brown slig ith occasiona angular to si	I relict
108.74.7	Poring	Drogross	and Water Ob	remations	1		hiselling		The second secon	Cooor	al Remarks
Date	Time	Depth		Casing Dia Water Dpt	1	From	To	Hours	From To 1		pit to 1.2m. 2
ara (C	, ALIC	pepti	, wante upt	and the state of		1.30 2.20 2.70 3.40 3.60 4.00	1.50 2.40 3.00 3.60 4.00 4.20	00:30 00:30 01:00 00:30 01:00 00:30	E fr	nvironment om 3.5m to ompleted to estalled 100 roundwater	al seal placed 4.5m. 3. 16.5m. 4. mm standpipe and gas nd sump for
	nsions in			: HGE Ltd nd Excavated/Dando 20	100		f: Cable p		100000	gged By:	Approved B

BOREHOLE No GI\_DZ4\_BH1007

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates:

409.05569.00004 25/07/2018 12.08m E535589 N191508



Project:

**IKEA Clear GI** 

2 of 3

	Clear	J.											2 of 3	
		SAM	PLES & TESTS	Ř.						STRAT	TA			aut
Depth	Type No	Test Type	Test Result	SPTN		Water	Reduced Level	Legend			DESC	CRIPTION		Instrument
7.00 - 7.45 7-	В	SPT	N=16	10 20	30 40	lsz.	5.18		ness)	slightly grav wood and r fine to coar (ENFIELD SI	velly silty CL/ rootlets. Gra rse flint. Sand ILT)	nottled brown slig AY with occasiona wel is angular to s d is fine to coarse ey slightly clayey:	htly sandy il relict ubangular	
8-		HS	650 ppm				3.78		(1.40)	silty sandy GRAVEL of (KEMPTON 690 Stron	angular to so flint. Sand is PARK GRAVI	ubrounded fine to fine to coarse.	coarse	
								X		Stiff dark gr selenite. Sa		y CLAY with occa	sional fine	ı
8.50 8.60 - 9.05	UT	u	65				2	X_X_		(LONDON C	CLAY) band of very o	clayey sand.		ŀ
9.10	D	SPT	N=18	18				X X X X X X X X X X X X X X X X X X X	(7.60)	900 Becon	nes slightly si	andy.		
11- 11.50- 11.95	υτ		5.0					X X X X X X X X X X X X X X X X X X X		] 11.00 Becc	omes very stij	ij.		
12.00 12-	D							<u> </u>						
	Roring I	Progress	and Water Ob	veryations		1		hiselling			Added	General	ral Remarks	=
	Time	Depth		1	Water Dpt	-	rom	То	Hours	From	To	1. Inspection		-
							1.30 2.20 2.70 3.40 3.60 4.00	1.50 2.40 3.00 3.60 4.00 4.20	00:30 00:30 01:00 00:30 01:00 00:30			Environment from 3.5m to Completed to Installed 100 groundwater monitoring a collecting DN	al seal place 4.5m. 3. o 16.5m. 4. mm standpi and gas nd sump for	ed
All dimens	ions in			r: HGE Ltd	1/Dando 20	11		i: Cable p		(shell and a	uger)	Logged By: G. Pursey	Approved	

BOREHOLE No GI\_DZ4\_BH1007

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 26/07/2018 12.08m E535589 N191508

**SLR** 

Project:

**IKEA Clear GI** 

.....

			SAM	PLES & TESTS							STRATA		+
2.441.0		Time					Water	Badusas		Depth	27111117		
Depti	h	Type No	Test Type	Test Result	SPT N 10 20	Value 30 40	3	Reduced Level	Legend		DES	CRIPTION	Instrument
13.00 - 13.45	13-	D	SPT	N=25		25			X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X	Stiff dark grey silty san selenite. Sand is fine. (LONDON CLAY)	dy CLAY with occa	sional fine
14.50 - 14.95	14-	UT D	U	90					X X X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X X X			
6.00 -	16-	D	SPT	N=45				-3.82	X X X X X X X X X X X X X X X X X X X	15.90	Dense light grey clayer	silty fine to coars	e SAND.
6.45	-	Name of the second						www B		(0.50)	(LAMBETH GROUP)		
6.50	3	D					3	-4.32 -4.42		16.40 16.50	Stiff light grey sandy Cl	.AY with packets o	f light
0,30	-							Alkera -	-		grey sand. Sand is fine (LAMBETH GROUP)		1
	17-										Borehole Co	emplete at 16.50m	
		Poring I	Progress	and Water Ob	terustions				hiselling		Water Added	Gener	al Remarks
Date	1	Time	Depth		Casing Dia	Water Dpt	-	rom	То	Hours	From To		pit to 1.2m.
								1.30 2.20 2.70 3.40 3.60 4.00	1.50 2.40 3.00 3.60 4.00 4.20	00:30 00:30 01:00 00:30 01:00 00:30		Environment from 3.5m to Completed to	al seal placed 4.5m. 3. 2.16.5m. 4. mm standpipe and gas nd sump for
All dir		ions in le 1:40	metres	Contractor Plant: Ha	: HGE Ltd nd Excavated	t/Dando 200	00:		d: Cable ş ze: 250n		(shell and auger)	Logged By: G. Pursey	Approved E

BOREHOLE No GI\_DZ4\_BH1008

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 26/07/2018 11.76m E535672 N191501

**SLR** 

Project:

**IKEA Clear GI** 

1 of 3

		SAM	PLES & TESTS			4				STRA	TA			ent
Depth	Type No	Test Type	Test Result	SPT N Va 10 20 30		Water	Reduced Level	Legend	Depth (Thick- ness)		DESC	RIPTION		Instrument
0.50	D ES	нѕ	4 ppm						(0.80)	occasional	rootlets. Gra rse concrete,	ly fine to coarse S wel is angular to s brick, flint and p	subangular	
	1						10.96		0.80			to coarse SAND	44	1
.00	1- D	HS	1 ppm						(0.80)	occasional clay. Grave	pockets of so I is angular to rete, plastic	oft to firm friable o surrounded fine	gravelly	
	1	SPT	N=22	€22			10.16		1.60					ı
							9.76		2.00	occasional Gravel is ar	pockets of d ngular to sub	itly gravelly silty ( ark brown clayey rounded fine to c	sand. oarse	
.00	2- D								(0.50)	brick, flint, coarse. (MADE GRI	OUND)	d clinker. Sand is f	fine to	4
	1	SPT	N=32		12		9.26	100	2.50	(MADE GR	ardstanding. OUND)			
	1	HS	8 ppm	7			- 3			200 Becom	mes mottled t	orown. eck slightly sandy	slightly	
.00	3 D	HS	0 ppm				8.66		(0.60) - 3.10	gravelly silt brown clay	ty CLAY with ey sand. Gra	occasional pocket vel is angular to rse brick, flint, co	ts of dark	
	1	7.2.2.	A.300 - 1	/			0.00	AT-17	3.10	and clinker	Sand is fine		ncrete	Æ
	1		400m 200	7			1 6				g hydrocarbo			
	1	SPT	N=13 1 ppm	913				Ž				d light brown slig AY with occasiona		П
	1						3	X = 2	(1.40)	Gravel is su		subrounded fine		
.00	4- 0	HS	236 ppm				1 3	XT-T		(ENFIELD S	ILT)			
	1		5-65					-0-		3 10 Stron	g hydrocarbo	n odour.		
	1.			1			7.26		4.50					
.50	] "	HS	N=9 115 ppm	9			- 0	xx		sandy sligh	tly gravelly s	ey mottled brown ilty CLAY. Gravel is dium flint, Sand is	\$	1
.00	5- D	HS	53 ppm						(1.00)	coarse		310111 111111 30110 13	Time to	
.00 - 5.45	UT	υ	28					x_		(ENFIELD S 4 50 Slight	t hydrocarbor	odour.		
	1							_X_						
5.50	D						6.26		5.50	Medium de silty SAND subrounde coarse.	and GRAVEL	ry slightly clayey s Gravel is angular rse flint. Sand is fi EL)	rto	
	Poring	Drogross	and Water Obs	remotions		Г		niselling			Added	Good	ral Remark	<u> </u>
Date	Time	Depth			Water Dpt	١.	rom		Hours	From	To	1. Inspection		-
Sac	iime	Depth	casing Upt	casing Ula	water Upt	_	2.00	To 2.40	01:00	5.50	6.50	1. Inspection Environment from 4.0m to Completed to Installed 100 groundwater monitoring a collecting DN	al seal place 5.0m. 3. 5.16.0m mm stand and gas and sump for	ced 4. pipe
All dime	nsions in	metres	Contractor	: HGE Ltd			Method	: Cable p	ercussion	(shell and a	uger)	Logged By:	Approv	red E
	cale 1:40		Plant: Car	ndo 2000/Han	d Excavate	d	Hole Siz	e: 250m	m		P. P. C. 1 C.	J. Blyth	FC	C

BOREHOLE No GI\_DZ4\_BH1008

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates:

409.05569.00004 26/07/2018 11.76m E535672 N191501



Project: Sheet

		SAM	PLES & TESTS	Ŷ.								STRA	TA		ent
Depth	Type No	Test Type	Test Result	10	SPT N	Valu	ue 40	Water	Reduced Level	Legend	Depth (Thick- ness)			CRIPTION	Instrument
7.00 7 7.00 7.00 - 7.45	B ES EW	SPT HS	N=18 70 ppm 121 ppm		18				3.76		(2.50) 8.00	Stiff dark gi	rey slightly s	an adour and sheet andy silty CLAY w c. Sand is fine.	n in water.
3.50 - 8.95 9.00 9	D	U	70												
0.00 - 10 0.45	D	SPT	N=20			0			200		(7.50)				
11- 1.50 - 1.95 2.00 12	UT													NOUGHT HIS DIRECT PAR	
	Boring	Progress	and Water O	-	tions	_			C	hiselling		Water	Added	-	ral Remarks
Date	Time	Depth	Casing Dpt	Casi	ng Dia	w	/ater Dpt		2.00	To 2.40	Hours 01:00	5.50	To 6.50	Environment from 4.0m to Completed t Installed 100 groundwater	o 16.0m., 4. Omm standpipe r and gas and sump for
All dimen	sions in		Contracto				Excavat	ed.		i: Cable p		(shell and a	uger)	Logged By: J. Blyth	Approved 8

BOREHOLE No GI\_DZ4\_BH1008

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 26/07/2018 11.76m E535672 N191501

**SLR** 

Project:

**IKEA Clear GI** 

3 of 3

			Q-10-2	0) 55 0 7555	,		_				Selection in a	66			44
	_		SAM	PLES & TESTS			- Gr		-	Donth	STRAT	IA			neu
Depth		Type No	Test Type	Test Result	SPT N	Value	Water	Reduced Level	Legend			DES	CRIPTION		Instrument
13.00 - 13.45 14.50 - 14.95	13-	D UT D	SPT HS U	N=27  O ppm 100  O ppm	10 20	27		Level		ness)		fine selenite	andy silty CLAY w . Sand is fine.	ith	THE STATE OF THE S
	1							8							
5.50	1	D					3	-3.74		15.50		ine to coarse	SAND with occa	sional	
	1									(0.50)	shell fragm (LAMBETH	ents.			
	16-		HS	0 ppm				-4.24		16.00	3,000		mplete at 16.00m	- }	8
	17-													9	
	Вс	oring F	rogress	and Water Ob	servations			Ch	niselling		Water	Added		ral Remark	_
Date	Tie	me	Depth	Casing Dpt	Casing Dia	Water Dpt		2.00	To 2.40	Hours 01:00	From 5.50	To 6.50	Inspection     Environment     from 4.0m to     Completed to     Installed 100     groundwater     monitoring a     collecting DN	al seal place 5.0m. 3. o 16.0m. Imm stands and gas and sump fo	ed 4. pipe
	ensin	ons in	metres	Contractor	: HGE Ltd			Method	- Cable n	ercussion	(shell and a	uger)	Logged By:	Approv	ed E

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1001 Client: London Borough of Enfield Project: **IKEA Clear GI** Ground Level: Project No: Date: Co-ordinates: Sheet 24/07/2018 10.90m E535475 N191654 409.05569.00004 1 of 1 SAMPLES & TESTS STRATA Instrume Backfill Depth Test Reduced (Thick-DESCRIPTION Depth Legend No Result Type Level ness) Grey slightly clayey slightly silty gravelly fine to coarse SAND with rare rootlets and low cobble content. Gravel is angular to subrounded fine to coarse brick, concrete, asphalt, flint, wood, cloth, clinker and rebar metal. Cobbles are subangular brick. (0.80)(MADE GROUND) 0.50 ES HS 480 ppm 10.10 0.80 Dark brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse flint, brick, timber and concrete. Sand is fine to coarse. (MADE GROUND) 0.80 Slight hydrocarban adaur. 1.20 (0.95)370 ppm 1.30 ES HS 9.15 Dark grey slightly gravelly clayey fine to coarse SAND with rare rootlets. Gravel is 1.80 D HS 350 ppm angular to subangular fine to coarse brick and flint. 1.80 ES (MADE GROUND) (0.58)1.75 Slight hydrocarbon odour. 8.57 Soft to firm dark grey mottled grey slightly gravelly silty CLAY. Gravel is angular to 2.40 HS 370 ppm (0.17)2.50 8.40 subrounded fine to coarse flint, 2.40 ES HS 90 ppm 8.30 (0.10)2.60 (ENFIELD SILT) 2.33 Slight organic odo Firm light brown mottled grey slightly sandy silty CLAY with rare gypsum crystals. Sand is fine to coarse. (ENFIELD SILT) (ENFIELD SILT) Firm locally soft dark grey mottled brown CLAY with occasional lenses of peat. (0.80)2.60 Slight organic odour. 3.20 HS 101 ppm 3.20 ES 7.50 Trial Pit Complete at 3.40m GENERAL REMARKS: Trial Pit Dimensions: Excavated to 3.4m. 2. Excavation was easy. 3. Backfilled with arisings. - 2.50-KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample Shoring/Support: D = Disturbed Sample B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1002 Client: London Borough of Enfield Project: **IKEA Clear GI** Ground Level: Project No: Date: Co-ordinates: Sheet 26/07/2018 E535565 N191657 409.05569.00004 11.00m 1 of 1 SAMPLES & TESTS STRATA Instrume Backfill Depth Туре Test Reduced (Thick-DESCRIPTION Depth Legend No Result Type Level ness) Grey mottled dark grey silty gravelly fine to coarse SAND with occasional rootlets and low cobble content. Gravel is angular to subangular fine to coarse concrete, brick, flint, glass and plastic. Cobbles are subangular concrete. (MADE GROUND) (0.80)0.50 ES HS 2 ppm 10.20 0.80 Dark grey clayey very sandy angular to subangular fine to coarse GRAVEL of clinker, brick, concrete, plastic, bone and metal wire with frequent pockets of ash 1.001 В and occasional pockets of clay and medium cobble content. Cobbles are (MADE GROUND) subangular brick. Sand is fine to coarse. (0.80)0.80 Slight hydrocarbon odour. 1.50 ES HS 16 ppm 9.40 1.60 D Dark grey mottled reddish brown slightly clayey very sandy angular to subangular fine to coarse GRAVEL of clinker, concrete and brick with occasional pockets of sandy clay and medium cobble content. Cobbles are subangular brick. Sand is fine to coarse. (MADE GROUND) 2.002 В 1.60 Slight hydrocarbon odour. 2.50 ES HS 62 ppm (1.90)7.50 3.50 Firm dark grey mottled grey and brown slightly gravelly silty CLAY with rare (0.20) 272 ppm 3.60 D HS pockets of grey fine to coarse sand and occasional rootlets. Gravel is angular to 7.30 ES subangular fine to coarse brick and clinker. (MADE GROUND) Trial Pit Complete at 3,70m GENERAL REMARKS: Trial Pit Dimensions: Excavated to 3.7m. 2. Excavation was easy. 3. Backfilled with arisings. + 3.00 -KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample Shoring/Support: D = Disturbed Sample B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1003 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 25/07/2018 E535654 N191648 409.05569.00004 9.98m 1 of 1 SAMPLES & TESTS STRATA Instrume Backfill Depth Type Test Reduced (Thick-DESCRIPTION Depth Legend No Result Type Level ness) (0.19) Concrete hardstanding. (MADE GROUND) 9.79 Grey mottled brown slightly clayey slightly silty gravelly fine to coarse SAND with occasional pockets of sandy clay. Gravel is angular to subangular fine to coarse (0.31)HS 0.40 ES clinker, brick, flint and concrete. 1 ppm 9.48 0.50 (MADE GROUND) 0.30 Becomes dark grey mottled black and brown. Soft to firm dark grey slightly gravelly silty sandy CLAY. Gravel is angular to 0.60 subangular fine to coarse brick, fint, clinker, chalk and timber. Sand is fine to (0.70)coarse. (MADE GROUND) 1.001 ES HS 1 ppm 0.50 Slight organic odour. 8.78 Concrete hardstanding. (0.20)(MADE GROUND) 8.58 1.45 ES HS 1 ppm Dark grey mottled reddish brown clayey sandy GRAVEL with occasional pockets of (0.15) 1.55 8 43 sandy clay. Gravel is angular to subangular fine to coarse flint, brick and clinker. 1.50 B 1.50 Sand is fine to coarse. D HS (MADE GROUND) 1 ppm 1.70 ES Firm dark grey mottled brown slightly sandy silty CLAY with occasional rootlets. Sand is fine to medium. (ENFIELD SILT) (0.80) 1.55 Slight organic odour. 7.63 Soft grey mottled brown slightly sandy clayey SILT, Sand is fine to medium. (ENFIELD SILT) 2.40 HS 1 ppm (0.15)2.50 7.48 2.40 ES Trial Pit Complete at 2.50m GENERAL REMARKS: Trial Pit Dimensions: Excavated to 2.5m. 2. Excavation was easy. 3. Backfilled with arisings. - 2.50-KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample Shoring/Support: D = Disturbed Sample B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1004 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 409.05569.00004 24/07/2018 11.68m E535495 N191605 1 of 1 SAMPLES & TESTS STRATA Instrume Backfill Depth Type Test Reduced (Thick-DESCRIPTION Depth Legend No Result Type Level ness) Grey mottled brown slightly clayer slightly silty gravelly SAND with medium cobble content. Gravel is angular to subangular fine to coarse brick, concrete, breeze block, flint, wood, plastic, rubber and steel. Cobbles are subangular brick, concrete and breeze block. (MADE GROUND) 0.50 R HS 1 ppm (1.10)0.50 ES 0.60 - 0.90 Band of compacted brick and concrete with occasional pockets of sandy clay. 10.58 1.10 Concrete hardstanding. (0.20) 1.20 ES (MADE GROUND) 10.38 Soft to firm dark grey mottled brown slightly sandy slightly gravelly silty CLAY. 1.40 D HS 46 ppm Gravel is angular to subangular fire to coarse brick, flint, clinker and timber. Sand is fine to coarse. (MADE GROUND) 1.30 Slight hydrod 1.30 Slight hydrocarbon adaus. (1.00) 9.38 Dark grey clayey gravelly fine to coarse SAND with occasional lenses of silty clay 2.40 ES HS 46 ppm and relict wood. Gravel is angular to subrounded fine to coarse flint. Sand is fine 2.50 В (0.40)to coarse 2.70 (ENFIELD SILT) 8.98 2.30 Strong hydrocarbon/creasate adour. Soft dark grey slightly sandy slightly gravelly silty CLAY. Gravel is angular to D 2.80 subrounded fine and medium flint. Sand is fine to coarse. (ENFIELD SILT) 2.70 Strong hydrocarbon/creosoteodour. (0.80)8.18 3.50 3.50 ES HS 1 ppm Firm brown mottled greyish brown slightly sandy CLAY, Sand is fine to medium. (0.10)3.60 8.08 3.60 D (ENFIELD SILT) 3.50 Slight hydrocarbon/creosote odour. Trial Pit Complete at 3.60m GENERAL REMARKS: Trial Pit Dimensions: Excavated to 3.6m. 2, Excavation was easy. 3. Backfilled with arisings. + 3.00 -KEY V = Hand Vane Shear Strength 0.90 PP = Pocket Penetrometer Shear Strength J = Jar Sample Shoring/Support: D = Disturbed Sample B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1005 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 409.05569.00004 25/07/2018 11.85m E535556 N191613 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-Depth DESCRIPTION Legend No Type Result Level ness) Grey mottled dark grey slightly silty gravelly fine to coarse SAND with medium cobble and boulder content. Gravel is subangular to subrounded concrete, brick, flint, steel, rebar, plastic and glass. Cobbles and boulders are angular to subangular concrete. (MADE GROUND) (1.90)1.001 HS ES 1 ppm 1.20 В 1.50 Occasional wood, wire, metal and breeze block present. 9.95 1.90 1,90 ES HS 1 ppm Trial Fit Complete at 1.90m GENERAL REMARKS: Trial Pit Dimensions: 1. Terminated at 1.9m due to concrete obstruction. 2. Excavation was easy. 3. Backfilled with arisings. + 3.00 -KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1006 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Sheet Co-ordinates: 26/07/2018 E535662 N191607 409.05569.00004 11.69m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-DESCRIPTION Depth Legend No Result Level Type ness) Dark grey mottled light grey slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse concrete, brick, flint, glass and plastic with rare asbestos cement sheet fragment. Cobbles are subangular brick and concrete. (MADE GROUND) (0.85)0.50 ES HS 1 ppm 10.84 0.85 Firm dark grey slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse brick, concrete, flint and clinker. Sand is fine to coarse. 1.001 ES HS 1 ppm (MADE GROUND) 0.85 Slight organi (0.50)0.85 Slight organic odour. 10.34 Dark grey slightly gravelly silty fine to coarse SAND with frequent roots and rootlets. Gravel is angular to subangular fine to coarse brick, flint and timber. HS 1.50 ES 1 ppm (0.35)(MADE GROUND) 1.70 1.35 Slight organic odo 9.99 Trial Pit Complete at 1.70m GENERAL REMARKS: Trial Pit Dimensions: Terminated at 1.7m due to concrete obstruction. Excavation was easy. 3. Excavation was easy, - 2.50-KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1007 Client: London Borough of Enfield Project: **IKEA Clear GI** Date: Ground Level: Co-ordinates: Project No: Sheet 25/07/2018 409.05569.00004 E535550 N191561 11.96m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Test Reduced (Thick-DESCRIPTION Depth Legend No Result Level Type ness) Greyish brown slightly slity slightly gravelly fine to coarse SAND with occasional rootlets. Gravel is angular to subangular fine to coarse concrete, brick, flint, plastic and glass. (MADE GROUND) (0.82)0.50 В ES HS 1 ppm 11.14 Soft to firm dark grey mottled light grey and brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse brick, concrete, flint, 1.001 D clinker, timber and metal wire. Sand is fine to coarse. (MADE GROUND) 0.82 Slight hydrocarbon odour, HS 61 ppm 1.50 ES 2.002 HS 31 ppm 2.00 ES (2.68)2.20 Occasional packets of slightly clayey slightly gravelly fine to coarse sand. 3.003 D 8.46 3.50 3.50 ES HS 31 ppm Dark grey slightly clayey SAND and GRAVEL with occasional pockets of slightly 3.60 sandy clay. Gravel is angular to subangular fine to coarse flint, concrete and brick. Sand is fine to coarse. (0.40) (MADE GROUND) MADE GROUND; 3.50 Slight hydrocarbon adour. Trial Fit Complete at 3.90m. 8.06 GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 3.9m. 2. Excavation was easy. 3. Backfilled with arisings. + 3.00 -KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1008 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 409.05569.00004 24/07/2018 E535614 N191560 12.72m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Test Reduced Depth (Thick-DESCRIPTION Legend Result Level Type ness) Grey slightly clayey gravelly fine to coarse SAND, Gravel is angular to subangular fine to coarse brick, concrete, flint, plastic, steel and clinker. (MADE GROUND) (0.84)ES HS 0.60 1 ppm 11.88 0.84 0.90 D Firm dark grey slightly sandy slightly gravelly silty CLAY with occasional pockets of sand. Gravel is angular to subangular fine to coarse brick, flint and clinker. Sand is (0.36)fine to coarse. 1.20 (MADE GROUND) 11.52 0.84 Slight hydrocarbon odour. Dark grey slightly clayey sandy angular to subangular fine to coarse GRAVEL of clinker, coal, flint, brick and concrete with occasional pockets of slightly gravelly 147 ppm sandy clay. Sand is fine to coarse. HS 1.50 (MADE GROUND) 1.50 ES 1.20 Slight hydrocarbon adour. 2.002 D (2.30)2.50 ES HS 152 ppm 3.008 В 9.22 3.50 Trial Pit Complete at 3.50m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 3.5m. 2. Excavation was easy. 3. Backfilled with arisings. + 3.00 -KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1009 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet E535668 N191553 409.05569.00004 25/07/2018 12.81m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-Depth DESCRIPTION Legend No Type Result Level ness) Dark grey mottled brown clayey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse brick, concrete, flint, plastic, glass, mortar and clinker. Cobbles are subangular concrete. (MADE GROUND) (1.75)1,001-ES HS 1 ppm Dark grey slightly sandy clayey angular to subangular fine to coarse GRAVEL of clinker, brick, concrete and chalk with pockets of slightly sandy slightly gravelly clay. Sand is fine to coarse. (MADE GROUND) 1.75 Slight 11.06 2.002 HS 1 ppm 2.00 ES (0.65)1.75 Slight organic odour. 10.41 2.40 Trial Pit Complete at 2.40m GENERAL REMARKS: Trial Pit Dimensions: 1. Terminated at 2.4m due to obstruction. 2. Excavation was easy. 3. Backfilled with arisings. - 2.50-KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

#### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1010 Client: London Borough of Enfield Project: **IKEA Clear GI** Date: Ground Level: Co-ordinates: Sheet Project No: 24/07/2018 E535535 N191522 409.05569.00004 11.44m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-DESCRIPTION Depth Legend No Result Level Type ness) Concrete hardstanding. (MADE GROUND) (0.54)0.40 10.90 0.50 ES HS 1 ppm 0.54 Dark brown slightly silty clayey gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse concrete, flint, steel, rebar metal, timber and clinker. Cobbles are subangular brick and concrete. (0.56)(MADE GROUND) 0.90 Disused pipe encountered. 1.001 D 1.10 10.34 Dark grey slightly clayey slightly sity gravelly fine to coarse SAND with occasional 1.20 ES HS 38 ppm pockets of soft sandy clay and frequent pockets of ash. Gravel is angular to subangular fine to coarse clinker, brick and flint. (MADE GROUND) 1.10 Strong hydrocarbon/creasate adour. (1.60)2.002 В 2.00 Frequent orangish brown clinker present. 2.60 ES HS 7 ppm 8.74 2.70 Firm locally soft dark grey slightly sandy silty CLAY. Sand is fine to medium. (ENFIELD SILT) 2.70 Strong hydrocarbon odour. 3.003 D (1.12)3.50 ES HS 70 ppm 7.62 Trial Pit Complete at 3.82m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 3.82m. 2. Excavation was easy. 3. Backfilled with arisings. - 2.50-KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1011 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 12.06m 409.05569.00004 25/07/2018 E535567 N191519 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced Depth (Thick-DESCRIPTION Legend Result Level Type ness) Grey slightly silty gravelly fine to course SAND with high cobble content. Gravel is angular to subangular fine to coarse concrete, brick, flint, glass, plastic, asphalt and rebar metal. Cobbles are subangular brick, concrete and asphalt. (MADE GROUND) (1.80)1.000 HS 1 ppm 1.00 ES 1.50 Becomes dark brown. 10.26 Dark grey mottled brown slightly slightly gravelly fine to coarse SAND with frequent pockets of ash and occasional pockets of brown slightly sandy slightly 2.002 HS 1 ppm gravelly clay. Gravel is angular to subangular fine to coarse brick, timber, clinker 2.00 ES and flint. (MADE GROUND) (1.00)2.50 В 2.70 ES HS 1 ppm 9.26 2.80 Trial Pit Complete at 2,80m. GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 2.8m. 2. Excavation was difficult. 3. Backfilled with arisings. + 3.00 -KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

### TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1012 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 25/07/2018 409.05569.00004 E535656 N191506 12.64m 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced Depth (Thick-DESCRIPTION Legend No Result Level Type ness) Dark grey mottled brown clayey SAND and GRAVEL with occasional pockets of slightly sandy slightly gravelly clay. Gravel is angular to subangular fine to coarse concrete, brick, flint, plastic, glass and cloth. Sand is fine to coarse. (MADE GROUND) (1.40)1.001 ES HS 1 ppm 11.24 Firm locally soft dark brownish grey slightly sandy slightly gravelly silty CLAY with HS 1.50 ES 1 ppm occasional pockets of clayey sand. Gravel is angular to subangular fine to coarse (0.30)brick, flint, clinker, concrete and glass. Sand is fine to coarse. 10.94 1.70 (MADE GROUND) 1.40 Slight organic odour. Reddish brown mottled brown clayey gravelly fine to coarse SAND with frequent pockets of ash and high cobble content. Gravel is angular to subangular fine to 2.002 ES HS 1 ppm coarse concrete, flint, brick, glass, metal and clinker. Cobble is subangular brick (0.80) and concrete. (MADE GROUND) 10.14 Trial Pit Complete at 2.50m GENERAL REMARKS: Trial Pit Dimensions: 1. Terminated at 2.5m due to obstruction. 2. Excavation was easy. 3. Backfilled with arisings. - 2.50-KEY 0.60 V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGE Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX G. Pursey FC

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1013 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 409.05569.00004 20/11/2018 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Туре Test Reduced Depth (Thick-DESCRIPTION Legend No Type Result Level ness) Brownish grey slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is angular medium to coarse flint, brick, concrete, glass, metal, wood, rubber mat. Cobbles are subangular brick and concrete. (MADE GROUND) HS 0.50 ES 7 ppm (1.83)HS 8 ppm ES 1.20 HS 10 ppm Trial Pit Complete at 1.83m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 1.83m. 2. Backfilled with arisings. 2.95 KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: None B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGF Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX DGJ FC LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH 3S5930:2015

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1014 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Sheet Co-ordinates: 409.05569.00004 20/11/2018 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-Depth DESCRIPTION Legend No Type Result Level ness) Brownish grey slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is subangular fine to coarse flint, brick, metal and concrete. Cobbles are subangular brick and concrete. (MADE GROUND) (0.79)0.40 ES HS 8 ppm 0.73 - 0.79 Layer of brick cobbles present. Greyish brown slightly gravelly clay. Gravel is subangular fine to coarse flint and brick. HS 5 ppm (MADE GROUND) (0.82)HS 7 ppm Black angular to subangular fine to coarse GRAVEL of clinker. (MADE GROUND) 1.80 ES 2.02 HS 7 ppm Trial Pit Complete at 2.02m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 2.02m. 2. Backfilled with arisings. - 2.20-KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: None B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGF Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX DGJ FC LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH 3S5930:2015

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1015 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Co-ordinates: Sheet 409.05569.00004 20/11/2018 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Test Reduced (Thick-Depth DESCRIPTION Legend No Type Result Level ness) Brownish grey slightly gravelly clayey medium to coarse SAND with low cobble content. Gravel is subangular medium to coarse flint, brick, metal. Cobbles are subangular brick. (0.54)0.30 ES (MADE GROUND) HS 5 ppm Black angular to subrounded medium to coarse GRAVEL of flint and clinker. (MADE GROUND) HS 6 ppm (1.09)1.30 ES HS 8 ppm Trial Pit Complete at 1.63m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 1.63m. 2. Backfilled with arisings. - 2.65 KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: None B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGF Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 DGJ FC LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH 3S5930:2015

					TF	RIAL P	IT LO	G					AL PIT No Z4_TP101	
Client:	on Bor	ough o	f Enfiel	d									6	
Project:	Clear C	21										SL	_R	
Project No:	ciear c	31	Dat	to-		Ground I	event-		Co-ordinates:			Sheet		_
	9.05569	.00004	Da		11/2018	Ground	ever.		co-ordinates.			-550000	1 of 1	
SAM	APLES &	TESTS		20	-				STRATA					ent
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)			DESCRI	PTION			Instrument
0.20 -	ES	HS	6 ppm				(1.55)	content. G	own slightly gravelly ravel is subangular f e subangular brick a DUND)	ine to coars	e flint, brick, con		cobble	
-		нѕ	6 ppm				1.59		Tr	ial Pit Comple	ete at 1.55m			
3														_
EV = Hand Vane P = Pocket Per = Jar Sample = Disturbed S S = Head Spac	Shear Streetrometr	ength er Shear S		ings.						0.90 0.90 Shoring/Su	pport: None	it Dimensio	ns:	]
All dimens	ions in n		1		HGF Ltd			Method: T	rial pit/trench		to	gged By:	Approved	i
Sea	e 1:30		Plant:	JCB	3CX							DGJ	FC	

					TF	RIAL P	IT LO	G				AL PIT No <b>Z4_TP10</b>	
lient: Londo	on Bor	ough c	f Enfiel	d								5	
Project:	Clear G	SI.									SL	_R*	
Project No: 40	9.05569	.00004	Dar		11/2018	Ground	Level:		Co-ordinates:		Sheet	1 of 1	_
SAN	1PLES &	TESTS			1				STRATA			-	ŧ
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)		ī	DESCRIPTION			facebook and make
0.40	ES	нѕ	7 ppm				(0.91)	rootlets and concrete, m (MADE GRO	wn slightly gravelly clay low cobble content. 6 etal and glass. Cobbles UND)	ravel is subangular	fine to coarse flint		
1-10-	ES	HS	48 ppm				(0.29)	Soft to firm (MADE GRO		w cobble content. C	obbles are angula	r brick.	
1.10	E3					<u> </u>	1.20	0.91 Slight i	hydrocarbon odour. Trial Pi	t Complete at 1.20m	(8		2
3-													
GENERAL REM 1. Excavated to 1		Backfille	d with arisi	ings.				<u> </u>		ा	rial Pit Dimensio	ns:	_
KEY V = Hand Vane S PP = Pocket Pen I = Jar Sample D = Disturbed S B = Large Bulk S HS = Head Spac	etromete ample ample	er Shear :	itrength						Sho	0.60 oring/Support: None	2.70	•	
All dimensi	ons in m				HGF Ltd			Method: Tri	al pit/trench		Logged By:	Approve	
Scal	e 1:30		Plant:	ICB	3CX						DGJ	FC	1

## TRIAL PIT No TRIAL PIT LOG GI\_DZ4\_TP1018 Client: London Borough of Enfield Project: **IKEA Clear GI** Project No: Date: Ground Level: Sheet Co-ordinates: 409.05569.00004 20/11/2018 1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Type Test Reduced (Thick-Depth DESCRIPTION Legend No Type Result Level ness) Greyish brown slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is subangular to subrounded medium to coarse flint, brick, concrete, metal and plastic. Cobbles are subangular brick and concrete. (MADE GROUND) (0.62)0.50 ES HS 10 ppm 0.62 Firm dark grey slightly gravelly CLAY. Gravel is subangular fine to medium flint. 12 (ENFIELD SILT) 0.62 Slight hydrocarbon adour. HS 13 ppm (1.11) 1.50 ES HS 12 ppm Trial Pit Complete at 1.73m GENERAL REMARKS: Trial Pit Dimensions: 1. Excavated to 1.73m. 2. Backfilled with arisings. - 2.40-KEY V = Hand Vane Shear Strength PP = Pocket Penetrometer Shear Strength J = Jar Sample D = Disturbed Sample Shoring/Support: None B = Large Bulk Sample Stability: Stable HS = Head Space Measurement All dimensions in metres Contractor: HGF Ltd Method: Trial pit/trench Logged By: Approved By: Scale 1:30 Plant: JCB 3CX DGJ FC LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH 3S5930:2015

					TF	RIAL P	IT LO	i	TRIAL PI	
lient:	S0 F344 S50	- (UNTER ON)								
11.12.00	on Bor	ough c	of Enfiel	d					CLD	3
roject: IKEA	Clear (	31							SLR	
roject No:			Da	te:		Ground	Level:	Co-ordinates:	Sheet	
40	9.05569	.00004		20/	11/2018				1 of 1	g.
SAM	APLES &	TESTS						STRATA	<u> </u>	ti.
Depth	Туре	Test	Test	Water	Reduced	Legend	Depth (Thick-	DESCRIPTION	ON	Instrument
	No	Type	Result		Level		ness)	Greyish brown slightly gravelly clayey fine to c		- Ins
0.30	ES	нѕ	9 ppm				(1.25)	content. Gravel is subangular to subrounded r concrete, metal and plastic. Cobbles are subar (MADE GROUND)	nedium to coarse flint, brick,	
1-		HS	7 ppm		1		-			8
1.10	ES	SHEET.	1275755				1.29			
-					-	-X-100000		Trial Fit Complete	at 1.25m	1000
-					-					
1					1					
-					-		-			
2					1		:			
-					-					
-					-		-			
1					1		:			
-					-		-			
1					1		:			
-					-					
3-					]		]			
37					] ]					
-					-					
1					]		:			
-					-		-			
1							:			
-					-					
ا ر							:			
*-					]		] .			
1					-		.			
]					]		:			
-					-					
NERAL REM	ARKS:						T			
xcavated to 1	.25m. 2	Backfille	d with aris	ings.					Trial Pit Dimensions:	
								-	2.10	<b>→</b>
Y							$\dashv$	t [		
<ul> <li>Hand Vane</li> </ul>			8187					0.60		
<ul> <li>Pocket Per Jar Sample</li> </ul>	etromet	er Shear :	Strength					+		
<ul> <li>Disturbed 5</li> </ul>								Shoring/Suppo		
<ul> <li>Large Bulk S</li> <li>Head Space</li> </ul>		rement						Stability: Stable	2	
All dimens	ions in n	netres	- 1		HGF Ltd			Method: Trial pit/trench	0.99	roved :
Sca	e 1:30		Plant:	JCB	3CX				DGJ	FC

## 

1 of 1 SAMPLES & TESTS STRATA Instrument Backfill Depth Туре Test Test Reduced (Thick-DESCRIPTION Depth Legend No Result Level Type ness) 0.15 Concrete hardstanding. 10.71 (MADE GROUND) Light grey very gravelly fine to coarse SAND with low cobble content. Gravel is angular to subrounded fine to coarse concrete, brick, flint and plastic fragments. 10.31 0.55 0.50 D HS 0 ppm Cobbles are subangular brick and concrete. 0.50 ES (MADE GROUND) 0.70 В Dark grey slightly clayey gravelly fine to coarse SAND with medium cobble (0.55)content. Gravel is angular to subrounded fine to coarse concrete, brick, flint and 1.00 D HS clinker. Cobbles are subangular brick and concrete. 0 ppm 9.76 (MADE GROUND) Firm orangish brown mottled dark grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse. (MADE GROUND) 1.50 D HS 0 ppm (0.90)8.86 D 2.00 HS 0 ppm Borehole Complete at 2.00m

Client:

Project No:

Project:

London Borough of Enfield

409.05569.00004

**IKEA Clear GI** 

	Boring Progress and Water Observations						Chiselling		Water	Added	Gener	al Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	То	Hours	From .	То	Inspection     Completed at Installed 50m ground gas m	2.0m. 3. m standpipe

All dimensions in metres Contractor: HGE Ltd Method: Window Sampler Logged By: Approved By: Scale 1:40 Plant: Premier Compact Hole Size: 115mm J. Keay FC

#### BOREHOLE No **BOREHOLE LOG** GI\_DZ4\_WS1002 **London Borough of Enfield** Project No: Ground Level: Co-ordinates: 409.05569.00004 30/07/2018 11,39m E535497 N191634 Project: Sheet **IKEA Clear GI**

1 of 1

Client:

Depth Type Test Type Reduced Legend (Thickness)  Reduced Legend (Thickness)  Light grey gravelly fine to coarse SAND with low cobble content. Gravel is angular to subrounded fine to coarse concrete, brick and flint. Cobbles are subrounded flint. (MADE GROUND)  1	
Use the content of the color of	Instrument
1- Borehole Complete at 0.90m	
4-             -	

	Boring Progress and Water Observations						Chisell	ing		Water	Added	Gener	al Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Opt	From	То		Hours	From .	То	pit collapse a	d at 0.9m due to nd concrete 2. Backfilled with
All din	mensions in	metres	Contractor	HGE Ltd		.1	/lethod: W	ndow	Sampler			Logged By:	Approved By:
	Scale 1:40		Plant: Pre	mier Compa	ct	F	lole Size: 3	300mr	m			J. Keay	FC

#### 

	SMINIT CE	& TESTS						STRATA	2			E
Depth	Type No	Test Type	Test Result	Reduced Level	Legend	Depth (Thick- ness)			DESCRI	PTION		Instrument
	-			11.09		0.30	Light grey grav coarse concret (MADE GROUN	e and brick.	irse SAND. G	ravel is angu	lar to subrounded fine to	8
	1.				-	-	Firm sandy gra	welly CLAY. Gra	ivel s angula	r to subrour	nded fine to coarse	10
50	1 0			10.69	1	0.70	(MADE GROUN	and flint. San	d is fine to co	parse.		
	1				-	-			orehole Comp	lete at 0.70r	n	1
	2											
	6-				1	1					1	5
		_	and Water O	-			Chiselling		Water	Added	General Reman	-
Date	Time	Depth	Casing Dp	Casing Dia	Water Dpt	From	То	Hours	From	То	Terminated at 0.7m concrete obstruction, Backfilled with arising	2.

Method: Window Sampler

Hole Size: 98mm

All dimensions in metres

Scale 1:40

Contractor: HGE Ltd

Plant: Premier Compact

Approved By:

FC

Logged By:

J. Keay

#### 

	SAI	MPLES	& TESTS						STRATA		Ħ
Depth		Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		Instrument
	-		112	2007	Г	11.09		0.30	Light grey gravelly fine to coarse SAND. Gravel is a coarse flint, concrete, brick, plastic, metal and gla		Ì
.30	3	ES	HS	2 ppm		10.89	18.2	0.50	(MADE GROUND) Concrete hardstanding with rebar,		1
	-		HS	4 ppm					(MADE GROUND)  Light brown slightly clayey gravely fine to coarse subangular fine to coarse flint, concrete, brick, pla (MADE GROUND)		1
	1-		HS	6 ppm					,		ı
			13170	5.85.11				(2.00)			I
	2-		HS	2 ppm							ı
	3					8.89		2.50	Soft dark grey mottled black slightly sandy slightly	gravelly silty CLAY with	102
00	3-	ES	HS	6 ppm					occasional lenses of peat. Gravel is subangular to Sand is fine to coarse. (ENFIELD SILT)		
00	4	ES	HS	23 ppm				(2.40)			
	-					6.49		4.90			
	5-					6.39	356536	5.00	Grey slightly clayey slightly silty SAND and GRAVE subrounded fine to coarse flint. Sand is fine to co (KEMPTON PARK GRAVEL)	arse.	[:]
	-								Borehole Complete at 5	00m	
	6- B	orina l	rngress	and Water	Ohter	vations		-	Chiselling Water Added	General Remar	lre
Date		ime	Depth		-	asing Dia	Water Dpi	From			
		X14(F)				**************************************	**************************************	1.90 2.30	2.30 01:00	require Cable Percussi 2. Completed to 5.0m. Installed 50mm stands ground gas monitoring	3. pipe

BOREHOLE No GI\_DZ4\_WS1003

Client:

# **London Borough of Enfield**

Project No: Ground Level: Co-ordinates: 409.05569.00004 31/07/2018 11.03m

E535580 N191656

Project:

S	AMPLES	& TESTS							STRATA				tu
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)			DESCRIP	TION		Instrument
					10.63		0.40	coarse concrete	e, flint and bri		avel is angu	ilar to subangular	
0.50 0.50 - 0.60	B ES	HS	8 ppm				(0.60)	Dark brown mo occasional root concrete, clinke (MADE GROUN	lets. Gravel is er and flint. D)	angular to su		to coarse SAND v fine to coarse bric	
.00 1	D	HS	3 ppm		10.03		(0.50)	angular to subr (MADE GROUN	led black sligh ounded fine t D)	ntly clayey gra- o coarse brick		coarse SAND. Gr clinker, flint and t	Chi 1998 C   1   1   1   1   1
.50	ES	HS	0 ppm		9.53		1.50	1.30 Dark red to 1.40 Small poc	orick staining p ket of yellowisi lightly gravell	resent. h brown fine to ly sandy CLAY.	Gravel is a	ngular to subroun	ded fine
.00 2-	D	HS	1 ppm				(1.00)	(MADE GROUN 1.50 Strong hy 2.20 Becomes	D) drocarbon odo				
50	D	нѕ	3 ppm		8.53		2.50	Soft dark grey r	subrounded drocarbon odo	fine to coarse		y gravelly silty CLA is fine to coarse.	Y. Gravel
.50	D	HS	31 ppm		7.13		3.90	3,50 Becomes				fragments.	
.00 4-	ES			V	7.03		4.00	Black mottled in KEMPTON PAR		ey fine to coar	se SAND.		/=
S-													
	Boring I	Progress	and Water (	Observ	/ations			Chiselling		Water	Added	Gener	al Remarks
Date	Time	Depth	Casing D	pt Ca	asing Dia	Water Dp	t Fron	То	Hours	From .	То	Completed Installed 50m ground gas m	nm standpipe

### BOREHOLE No **BOREHOLE LOG** GI\_DZ4\_WS1004 **London Borough of Enfield** Project No: Ground Level: Co-ordinates: 409.05569.00004 01/08/2018 E535608 N191622 11.93m Project: Sheet **IKEA Clear GI**

1 of 1

Client:

Depth Type Test No Type Reduced Legend Chick-ness DESCRIPTION  1-		E G
Light grey gravelly fine to coarse SAND with high cobble content angular to subangular fine to coarse brick, concrete, timber, plate Cobbles are subangular brick and concrete.  (MADE GROUND)  1.10  1.20  D  HS  Oppm  1.30  D  HS  Oppm  1.30  Oppm  1.30  Oppm  1.30  Oppm  1.30  Oppm  Oppm		Instrument
1.20 D HS 0 ppm 10.63 1.30 Reddish brown gravelly fine to coarse SAND. Gravel is angular to to coarse brick.  (MADE GROUND) Dark grey mottled yellowish brown slightly clayey gravelly fine with occasional pockets of dark grey mottled yellowish brown gravelly fine with occasional pockets of dark grey mottled yellowish brown gravelly fine with occasional pockets of dark grey mottled yellowish brown gravelly fine with occasional pockets of dark grey mottled yellowish brown gravelly fine to coarse concrete, flint an (MADE GROUND)	nt. Gravel is	
1.50 D HS 0 ppm 10.63 1.30 to coarse brick.    (MADE GROUND)	to subangular fine	3
Dark grey mottled yellowish brown slightly clayey gravelly fine with occasional pockets of dark grey mottled yellowish brown (0.70)  Gravel is angular to subangular fine to coarse concrete, flint an (MADE GROUND)	to subangular fine	
2- US 0.00m 9.93 2.00	gravelly clay.	
	-	
	Table 2 degree degree	
Boring Progress and Water Observations Chiselling Water Added  Date Time Depth Casing Dpt Casing Dia Water Dpt From To Hours From To 1. Cor	General Remarks	

	Boring	Progress ar	nd Water Obs	servations			Chiselling		Water	Added	Gener	al Remarks
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	То	Hours	From	То	Completed installed 50m ground gas m	m standpipe for
All din	nensions in Scale 1:40		Contractor	HGE Ltd	het.		ethod: Wind	5.5	9		Logged By: J. Keav	Approved By:

# BOREHOLE LOG BOREHOLE NO GI\_DZ4\_WS1005 BOREHOLE NO GI\_DZ4\_WS1005 BOREHOLE NO GI\_DZ4\_WS1005 BOREHOLE NO GI\_DZ4\_WS1005

1 of 1

Project: Sheet

IKEA Clear GI

Client:

Project No:

**London Borough of Enfield** 

409.05569.00004

Scale 1:40

Plant: Premier Compact

	SAMPLE	S & TESTS	5	-				STRATA	<u> </u>		ent
Depth	Type	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)		DESCRIPTION		Instrument
	-			Т	9.77		0.20	Concrete hardstanding with	rebar,		H
	1				9.62 -		0.35	Timbe and and	arse SAND. Gravel is ang	ular to subangular fine to	
.50	10	HS	2 ppm				1117	coarse flint and concrete.			
	1	"	L ppiii		9.37		0.60	(MADE GROUND) Stiff grey mottled orangish t	rown slightly gravelly sar	ndy CLAY. Gravel is angular	
	1				9.07		0.90	to subangular fine to coarse			
.00	1- D	HS	3 ppm		5.07		0.50	coarse. (MADE GROUND)			
.00	ES		- ,,,					Stiff dark brown mottled ora angular to subangular fine t			
50	1.	1100	7 ann				(1.10)	Sand is fine to coarse. (MADE GROUND)			
.50 .50	- ES	HS	3 ppm					Stiff locally firm grey mottle			
	1				1 3			occasional small pockets of to coarse clinker. Sand is fin		s angular to subangular fine	
	, -				7.97		2.00	(MADE GROUND)			
	-						-	0.90 Slight hydrocarbon odo 1.70 Pocket of pale yellow fi			1
	1				1 3				Sorehole Complete at 2.00r	m	
	1						1 3				
	1						-				
	1				:	1	:				
	,				1 :		:				
	°7				-	-	-				
	1				:		:				
	1				1 :		:				
	7				-		-				
	1				:		:				
	Ŀ				1 :	1					
	"]				-	-	-				
	1				:		:				
	1				:		:				
	7				-		-				
	1				:		:				
					-		-				
	"]				-	-	-				
	1				:		:				
	1					1	-				
	7				:	-	-				
	1				:		:				
	-						-				
	1										
	Boring	Progress	and Water	Obser	vations			Chiselling	Water Added	General Remark	S
Date	Time	Depti	Casing t	opt (	Casing Dia	Water Dp	t Fron	To Hours	From To	Completed to 2.0m.     Installed 50mm standp	
										ground gas monitoring	
				$\perp$							

Hole Size: 98mm

J. Keay

FC

# BOREHOLE LOG BOREHOLE NO GI\_DZ4\_WS1006 BOREHOLE NO GI\_DZ4\_WS1006 BOREHOLE NO GI\_DZ4\_WS1006 BOREHOLE NO GI\_DZ4\_WS1006

Project: Sheet

IKEA Clear GI

Client:

Project No:

**London Borough of Enfield** 

409.05569.00004

Date Time Depth Casing Dpt Casing Dia Water Dpt From To Hours From To 1. Completed to 2 Installed 50mm st	(30.200	A Clear	37.50							1 of 1	
No Type Result Level ness)  Light grey gravelly fine to coarse SAND with low cobble content. Gravel is an to subrounded fine to coarse flint, brick and concrete. Cobbles are subangul concrete.  (MADE GROUND)  10.94  10.94  10.94  10.95  Light grey gravelly fine to coarse SAND with low cobble content. Gravel is an to subrounded fine to coarse flint, brick and concrete. Cobbles are subangul concrete.  (MADE GROUND)  10.94  10.95  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  10.90  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular subangular fine to coarse concrete, brick and clinker. Sand is fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  Soft dark brown mottled black sightly gravelly sandy CLAY. Gravel is angular fine to coarse concrete, brick and clinker. Sand is fine to coarse.  10.90  Soft dark brown mottled black sightly gravely sandy CLAY. Gravel is angular fine to coarse concrete, brick and concrete for coarse concrete, brick and concrete for coarse.  10.90  Soft dark brown mottled black sightly gravely sandy CLAY. Gravel is angular fine to coarse concrete, brick and concrete for coarse.  10.90  Soft dark brown mottled black sightly sandy coarse for coarse.  10.90  Soft d		SAMPLES	& TESTS	S	-				STRATA		ent
Light grey gravelly fine to coarse SANO with low cobble content. Gave is an to subrounded fine to coarse fillri, brick and concrete. Cobbles are subangul to subrounded fine to coarse fillri, brick and concrete. Cobbles are subangul to subrounded fine to coarse fillri, brick and concrete. Cobbles are subangul for the coarse concrete. Whole GROUND)  10.94  10.94  10.95  10.96  10.90  10	Depth				Wate	The second second second	Legend	(Thick-	DESCRIPTION		Instrument
1.00 1 D HS 16 ppm 1.00 2 D Borehole Complete at 2.00m Borehole Complete at			нѕ	35 ppm		10.94		(0.60)	to subrounded fine to coarse flint, brick and concrete concrete. (MADE GROUND)	. Cobbles are subangular	
Boring Progress and Water Observations  Borelole Complete at 2.00m	.00	] 1- D						(1.40)	subangular fine to coarse concrete, brick and clinker. (MADE GROUND)		
Boring Progress and Water Observations  Chiselling Water Added General Re  Date Time Depth Casing Dpt Casing Dia Water Dpt From To Hours From To Installed 50mm st	.00	2 D	HS	16 ppm		9.54		2.00			
Date Time Depth Casing Dpt Casing Dia Water Dpt From To Hours From To 1. Completed to 2 Installed 50mm st	,	5									
Installed 50mm st		Boring	Progress	and Water	Obser	vations			Chiselling Water Added	General Remar	ks
	Date	Time	Depti	h Casing i	Dpt C	Casing Dia	Water Dp	t Fron	n To Hours From To	Completed to 2.0m. Installed 50mm stand; ground gas monitoring	ipe f
All dimensions in metres Contractor: HGE Ltd Method: Window Sampler Logged By: All Scale 1:40 Plant: Premier Compact Hole Size: 74mm J. Keay										The second secon	ved B

## BOREHOLE No **BOREHOLE LOG** GI\_DZ4\_WS1007 **London Borough of Enfield** Ground Level: Co-ordinates: 01/08/2018 E535635 N191588 12.62m Sheet

1 of 1

Client:

Project No:

Project:

409.05569.00004

**IKEA Clear GI** 

SA	MPLES	& TESTS		-				STRATA
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION
0.50 0.50 - 0.60	B ES	нѕ	0 ppm				(1.20)	Dark brown slightly clayey gravely fine to coarse SAND with occasional rootlets.  Gravel is angular to subangular fine to coarse brick, concrete, clinker, flint and plastic.  (MADE GROUND)
1.00 1-	D	HS	2 ppm		11.42		1.20	
L30	D				11.22		1.40	Firm locally soft dark grey slightly gravelly sandy CLAY with occasional pockets of orangish brown fine to coarse sand. Gravel is angular to subangular fine to
1.80	ES	HS	0 ppm		10.62		2.00	coarse brick, concrete and flint. Sand is fine to coarse. (MADE GROUND)  Reddish brown sandy angular to subangular fine to coarse GRAVEL of brick. Sand is fine to coarse. (MADE GROUND)
3- 4-								Soft dark brown mottled black slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse brick, clinker and concrete. Sand is fine to coarse. (MADE GROUND)  1.60 Slight hydrocarbon odour.  Borehole Complete at 2.00m

	Boring I	Progress ar	nd Water Obs	ervations			Chiselling		Water	Added	General Remarks	
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	То	Hours	From .	То	Completed installed 50m ground gas m	m standpipe for
All dim	nensions in	metres	Contractor	HGE Ltd		M	ethod: Windo	ow Sampler			Logged By:	Approved By
	Scale 1:40		Plant: Pre	mier Compa	ct	H	ole Size: 74m	nm			J. Keav	FC

BOREHOLE No GI\_DZ4\_WS1008

Client:

# **London Borough of Enfield**

Project No: Date: Ground Level: Co-ordinates: 409.05569.00004 31/07/2018 12.33m E535575 N19

Co-ordinates: E535575 N191543



Project:

**IKEA Clear GI** 

Scale 1:40

Plant: Premier Compact

1 of 1

Sheet

J. Keay

Denth	Type Tes No Typ	st Test	Age Redu		Depth (Thick-	STRATA	DESCRIPTION	7
0.50 - 0.60							DESCRIP TION	
2.50 - 0.60	В				ness)	Light grey gravelly fine to co coarse concrete, brick, plast (MADE GROUND)		
1	٠		11.63	-	0.70			
			11.43	-	0.90	Concrete hardstanding. (MADE GROUND)		
1.40	D				(0.80)	Firm locally soft grey mottle Gravel is angular to subangu ceramics, rubber, clinker and (MADE GROUND)	lar fine to coarse concrete, I	brick, plastic, metal,
1			10.63	-	1.70		Sorehole Complete at 1.70m	
3- 4- 5-	oring Progr	ress and Water	Observation	5		Chiselling	Water Added	General Remarks
2-37 E 2		epth Casing t		1	t Fron	To Hours	() (SAVE () () (SAVE ()	Completed to 1.7m. installed 50mm standpip ground gas monitoring.

Hole Size:

## BOREHOLE No **BOREHOLE LOG** GI\_DZ4\_WS1008A **London Borough of Enfield** Project No: Ground Level: Co-ordinates: 409.05569.00004 31/07/2018 E535575 N191543 12,33m Sheet **IKEA Clear GI**

1 of 1

FC

J. Keay

Client:

Project:

Scale 1:40

Plant: Premier Compact

	SAI	MPLES	& TESTS	S	-				STRATA	ent
Depth		Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION	Instrument
50		D	нѕ	0 ppm				(1.10)	Light grey mottled dark brown gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse brick, concrete, plastic, glass, ceramic and flint.  (MADE GROUND)	
	1-		HS	9 ppm		11.23		1.10	0.90 Becomes slightly clayey.	1
50		D	нѕ	2 ppm				(0.80)	Firm dark grey mottled yellowish brown slightly gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse brick, concrete, glass, ceramic, flint, clinker and timber. (MADE GROUND)	
00	2-	D ES	HS	16 ppm		10.43		1.90	Soft to firm light brown mottled dark grey slightly silty slightly gravelly sandy CLAY with occasional shell fragments. Gravel is angular to subangular fine to coarse brick, flint and clinker. Sand is fine to coarse. (MADE GROUND)	
	-		нѕ	10 ppm					1.90 Moderate hydrocarbon odour.  2.50 Packet of concrete gravel.	
00	3-	D	HS	6 ppm				(2.10)	3.10 Becomes soft.	
	-		HS	4 ppm					3,50 - 3.60 Band of dark grey sand.	
00	4-	D	HS	5 ppm	G	8.33		4.00	Borehole Complete at 4.00m	
	5									
	В	oring	Progress	and Water	Obser	vations			Chiselling Water Added General Remai	ks
Date		ime	Depti		-	Casing Dia	Water Dp	t Fron		pipe t
All dime	ensi	ons in	metres	Contrac	tor:	HGE Ltd			Method: Window Sampler Logged By: Appro	ved (

Hole Size: 98mm

## 

1 of 1

Client:

Project No:

**IKEA Clear GI** 

Project:

			0.75				A SANGERY	/		0.1
Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)		DESCRIPTION		Instrument
D	нѕ	4 ppm		10.46		(0.60)	angular to subrounded fine t subangular brick and concre (MADE GROUND)	o coarse flint, concrete and e.	d brick. Cobbles are	
1-	нѕ	119 ppm				(1.40)	content. Gravel is angular to clinker. Cobbles are subangu (MADE GROUND) 0.60 Slight hydrocarbon odos	subrounded fine to coarse ar brick. r.		
1				-						
2-				9.06		2.00		orehole Complete at 2.00m	5	H
3-										
6-					- 10					4
	No	No Type  D HS ES	No Type Result  D HS 4 ppm ES	No Type Result  D HS 4 ppm ES	No Type Result Level	No Type Result Level	No Type Result Level ness)  (0.60)  D HS 4 ppm 10.46 0.60  HS 119 ppm (1.40)	No Type Result Level ness Uight grey gravelly fine to coa angular to subrounded fine to subrounded fine to subrounded fine to subangular brick and concret (MADE GROUND)  D HS 4 ppm 10.46 0.60 Black gravelly fine to coarse to content. Gravel is angular to clinker. Cobbles are subangular to clinker.	No Type Result Level ness)  Light grey gravelly fine to coarse SAND with medium coangular to subrounded fine to coarse flint, concrete and subangular brick and concrete. (MADE GROUND)  ES  Black gravelly fine to coarse SAND with frequent pocket content. Gravel is angular to subrounded fine to coarse clinker. Cobbles are subangular brick. (MADE GROUND)  0.60 Sight hydrocarbon odour.  1.20 - 1.30 Band of yellow fine to coarse sand.	No Type Result Level (1955)  Light grey gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subrounded fine to coarse flint, concrete and brick. Cobbles are subangular brick and concrete.  (MADE GROUND)  Black gravelly fine to coarse SAND with frequent pockets of ash and low cobble content. Gravel is angular to subrounded fine to coarse brick, concrete and clinker. Cobbles are subangular brick.  (MADE GROUND)  0.60 Slight hydrocarbon adour.  1.20 - 1.30 Band of yellow fine to coarse sand.

Boring Progress and Water Observations							Chiselling Water Add				led General Rema		
Date	Time	Depth	Casing Dpt	Casing Dia	Water Dpt	From	То	Hours	From .	То	Completed installed 50m ground gas m	m standpipe for	
All dimensions in metres Contractor: HGE Ltd							Method: Window Sampler				Logged By:	Approved By	
Scale 1:40 Plant: Premier Compact							ole Size: 74m	m		J. Keav	FC		

## 

1 of 1

Client:

Project No:

**IKEA Clear GI** 

Project:

SAMPLES & TESTS				-	STRATA						
Depth	Type No	Test Type	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION	Instrument		
.50 - 0.60	В	нѕ	0 ppm				(1.10)	Dark brown slightly clayey gravely fine to coarse SAND. Gravel is angular to subangular fine to coarse brick, concrete, plastic, fabric, metal, flint and timber. (MADE GROUND)			
.00 1	D	HS	0 ppm		11.21		1.10				
					11.01		1.30	podeligular line and medium brick, plastic and fillit. Sand is file to coarse.			
.50	D				10.51		(0.50)	(MADE GROUND)  Firm dark grey mottled black slightly gravelly clayey fine to coarse SAND. Gravel is angular to subangular fine to coarse brick, concrete and flint.  (MADE GROUND)  1.30 Slight hydrocarbon odour.			
.00 2- 3- 3-	ES	нѕ	0 ppm		10.31		2.00	Black gravelly fine to coarse SAND with frequent pockets of ash. Gravel is angular to subangular fine to coarse brick, concrete and flint.  (MADE GROUND)  1.80 Slight hydrocarbon edour.  Borehole Complete at 2.00m			

	Boring Progress and Water Observations							g	Added	General Remarks			
Date	Time	Depth	Casing Dpt	Casing Dia	Water Opt	From	То	Hours	From .	То	Completed Installed 50m ground gas m	f to 2.0m. 2. nm standpipe for	
All din	All dimensions in metres Contractor: HGE Ltd						fethod: Wind	dow Sampler		Logged By:	Approved By:		
Scale 1:40 Plant: Premier Compact						Э	ole Size: 74	mm		J. Keay	FC		