A3

511400

511600

180200

09/03/2022 15:54:52

BH101(S)

WS201

WS204

WS214

BH106(S)

WS206

WS207C

BH105

Beaconsfield Rd

Legend

Site boundary

Gas/ vapour monitoring standpipe

Client

Colt Data Centre Services Limited

Metres

0 12.5 25 50

Rev	Date	By	Chkd	Appd	Authd
F1	2022-03-09	CN	TM	CB	CB

Job Title

London4

Drawing Title

Ground gas and vapour monitoring location plan

ARUP

8 Fitzroy Street
London W1T 4BJ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Scale at A3

1:1,100

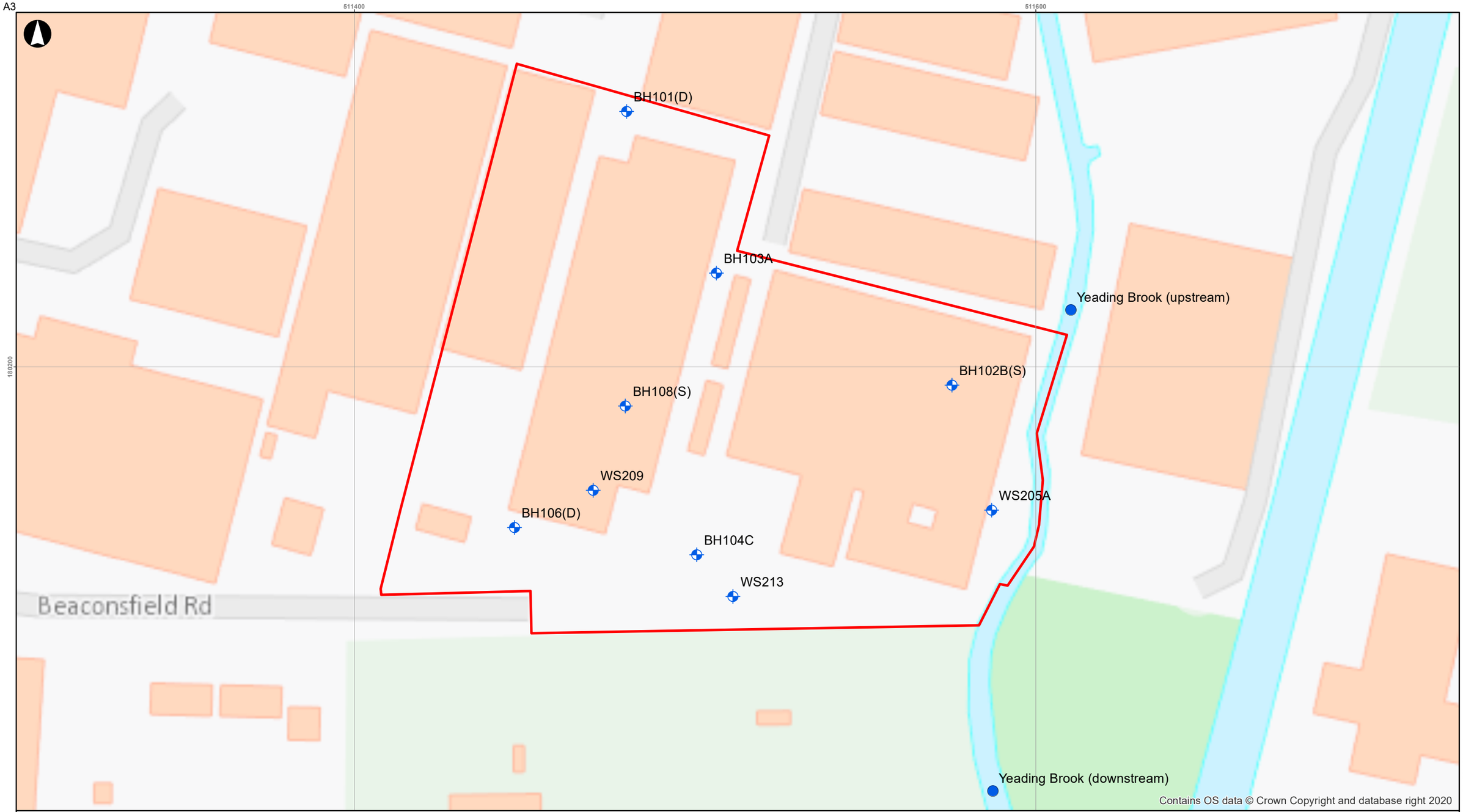
Drawing Status

For Issue

Job No	Drawing No	Rev
281528-00	004	F1

\\globalgis\UK\281000\281528-00 London 4\mxd\Lon4_ARP_E_ContaminationRA_R220304.mxd

A3



Legend

Site boundary

Water monitoring location

Surface water sampling location

Groundwater level monitoring and sampling standpipe (LHG)

Client
Colt Data Centre Services Limited

Metres
0 12.5 25 50

Rev	Date	By	Chkd	Appd	Authd
F1	2022-03-09	CN	TM	CB	CB

Job Title
London4

Drawing Title
Groundwater and surface water monitoring location plan

ARUP
8 Fitzroy Street
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www.arup.com

Scale at A3
1:1,100

Drawing Status
For Issue

Job No	Drawing No	Rev
281528-00	005	F1

\\global\gis\UK\281000\281528-00 London 4\mxd\Lon4_ARP_E_ContaminationRA_R220304.mxd

A3

511400

511600

180200

09/03/2022 17:11:25

WS202

BH107

WS201

BH103A

TP305

BH102

TP308

BH108

WS209

WS206

nsfield Rd

Legend

- Site boundary
- Asbestos containing material (ACM)
- Positive asbestos identification in soil

Client

Colt Data Centre Services Limited

Metres

0 12.5 25 50

Rev	Date	By	Chkd	Appd	Authd
F1	2022-03-09	CN	TM	CB	CB

Job Title

London4

Drawing Title

Asbestos identifications in soil

ARUP

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www.arup.com

Scale at A3

1:1,100

Drawing Status

For Issue

Job No	Drawing No	Rev
281528-00	006	F1

\\global\gis\UK\281000\281528-00 London 4\mxd\Lon4_ARP_E_ContaminationRA_R220304.mxd

Appendix A

Concept factual report

FACTUAL REPORT

L4 Colt DCS Data Centre

PREPARED FOR: HDCI Hayes London Limited

ISSUE 02

Concept: 21/3600- FR01 **10/02/2022**

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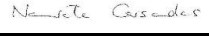
DOCUMENT ISSUE REGISTER			
Project Name:	L4 Colt DCS Data Centre		
Project Number:	21/3600		
Document Reference:	21/3600 - FR01	**Current Issue**	Issue 02
Document Type:	Site Investigation Report		

Development	**Name**	**Signature**	**Date**
Prepared by:	N Carsandas		10/02/2022
Checked by:	O Savvidou		10/02/2022
Approved by:	D Freeland		10/02/2022

Issued to:	Ove Arup & Partners /Concert

Date	Issue	Amendment Details/ Reason for issue	Issued to
12/01/2022	Issue 00	DRAFT	Arup
07/02/2022	Issue 01	DRAFT: Updated with geotechnical test results and comments	Arup/Concert
10/02/2022	Issue 02	FINAL: Updated with electrochemical lab results	Arup/Concert

Notes:

CONTENTS

1. PROJECT PARTICULARS

Site Location:	L4 Colt DCS Data Centre
Client:	HDCI Hayes London Limited
Investigation Supervisor:	Ove Arup & Partners
Fieldwork:	10/08/2021 – 08/11/2021
Laboratory Work:	09/08/2021– 10/02/2022

2. PURPOSE AND SCOPE OF WORKS

The purpose of the investigation was to understand the ground and groundwater conditions at the site and to determine the nature and extent of any ground and groundwater contamination and establish geotechnical parameters for use in design.

The proposed development at the site included demolition of the existing structures on site and the construction of a five-storey data centre.

The scope of the works comprised the following:

- 10 No. Cable Percussion Boreholes to a maximum depth of 57.00m;
- 18 No. Dynamic Sampler Boreholes to a maximum depth of 6.00m;
- 11 No. Hand and Machine Excavated Trial Pits to a maximum depth of 3.10m;
- 1 No. Hand Excavated Trial Trench comprising three parts to a maximum depth of 1.60m;
- 1 No. Machine Excavated Trial Pit to facilitate infiltration test to a depth of 2.20m;
- Determination of Bulking Factor;
- Logging, sketching and Photographing;
- Surveying of exploratory hole locations and ground levels;
- Instrumentation Monitoring and Sampling;
- Geotechnical & Chemical Testing.

Table 1 – Exploratory Hole List

Hole ID	Hole Type	Depth (m)	Easting	Northing	Level (mOD)
BH101	CP	57.00	511479.91	180275.05	29.68
BH102	IP	0.80	511595.37	180211.83	29.01
BH102A	IP	1.80	511586.27	180206.35	29.17
BH102B	CP	22.50	511575.43	180194.67	29.18
BH103	IP	1.10	511505.79	180225.51	29.69

Hole ID	Hole Type	Depth (m)	Easting	Northing	Level (mOD)
BH103A	CP	40.00	511506.31	180227.49	29.70
BH104	IP	1.70	511500.93	180169.11	29.13
BH104A	IP	1.50	511501.73	180167.53	29.13
BH104B	IP	0.73	511498.63	180168.66	29.15
BH104C	CP	50.45	511500.52	180144.85	29.28
BH105	CP	48.50	511561.17	180129.27	28.54
BH106	CP	47.50	511447.04	180152.91	29.70
BH107	CP	49.50	511463.04	180236.67	29.68
BH108	CP	25.45	511479.57	180188.55	29.79
BH109	CP	25.00	511539.88	180208.41	29.17
BH110	CP	48.45	511514.83	180265.33	29.60
IT501	TP	2.20	511500.44	180145.44	29.31
TP301	TP	1.18	511495.02	180264.54	29.80
TP302	TP	3.10	511447.75	180140.19	29.86
TP303	TP	3.00	511510.07	180135.18	29.23
TP304	TP	3.00	511473.56	180132.98	29.63
TP305	TP	1.20	511556.09	180220.43	29.00
TP306	TP	0.90	511559.75	180140.45	28.88
TP307	TP	0.70	511514.67	180197.79	29.01
TP308	TP	0.90	511453.39	180193.43	30.17
TP309	TP	1.00	511469.38	180255.66	30.50
TP309A	TP	1.30	511470.78	180255.55	29.79
TP310	TP	1.00	511588.7	180171.31	29.12
TT401A	TT	1.60	511550.21	180131.86	28.68
TT401B	TT	1.20	511552.19	180137.05	28.78
TT401C	TT	0.70	511545.76	180137.05	28.88
WS201	DS	3.00	511483.49	180235.93	29.79
WS202	DS	3.00	511516.97	180264.71	29.64
WS203	DS	2.00	511533.28	180226.84	29.02
WS204	DS	1.60	511517.48	180213.36	28.91
WS205	DS	0.70	511585.38	180150.73	28.86
WS205A	DS	4.00	511587.03	180157.88	28.95
WS206	DS	4.00	511549.77	180141.08	28.98
WS207	IP	1.00	511542.45	180125.26	28.83
WS207A	IP	0.60	511543.55	180130.20	28.78
WS207B	IP	0.60	511547.35	180129.60	28.71
WS207C	DS	6.00	511541.91	180130.64	28.86
WS208	DS	3.00	511504.32	180149.42	29.16
WS209	DS	4.00	511470.12	180163.81	29.81
WS210	DS	2.00	511451.84	180167.31	29.78

Hole ID	Hole Type	Depth (m)	Easting	Northing	Level (mOD)
WS211	DS	2.00	511475.00	180197.97	29.74
WS212	DS	2.00	511464.63	180226.85	29.79
WS213	DS	4.00	511511.17	180132.7	29.26
WS214	DS	4.00	511554.73	180203.21	29.18
WS215	DS	4.00	511539.88	180208.41	29.17
WS216	IP	1.20	511574.77	180194.93	29.18
WS217	DS	1.60	511523.14	180155.38	29.61
WS218	IP	0.48	511567.29	180155.80	28.93
WS218A	IP	0.37	511567.52	180156.72	28.92

Key

CP – Cable Percussion Borehole
DS – Dynamic Sampler Borehole
TP – Trial Pit
TP – Trial Trench
IP – Inspection Pit / Aborted Borehole Location

3. DESCRIPTION OF WORKS

The works were carried out in accordance with the Arup "L4 Colt DCS Data Centre" Ground Investigation Specification document with reference DCS20109-ARUP-DC-CO-XX-SP-C-00003, Issue P01, dated 19 May 2021 and Concept's Method Statement with reference no: 21/3600-RAMS-02, dated 06/08/2021.

The site was bounded by the Yeading Brook to the east, Beaconsfield Road to the south, an access road to the west and industrial warehouses/structures to the north. The site was at National Grid Reference TQ116 801 in the London Borough of Hillingdon.

The locations of all exploratory holes are shown in the Exploratory Hole Location Plan presented in Section 7 of this report.

4. INVESTIGATION METHODS

4.1 Ground Penetrating Radar Survey (GPR)

The GPR survey was undertaken by Midlands Survey Ltd. at all locations. All the services were marked out on the ground.

4.2 Utilities Survey and Inspection Pits

Prior to boring commencing all exploratory hole locations were checked for utilities /buried services using a CAT and genny, existing utility information and hand dug inspection pits to an appropriate depth as identified by the services plans to a maximum depth of 1.70m.

Where surface concrete and asphalt encountered were broken out by hand held electric breaker or diamond cored.

4.3 Unexploded Ordnance Clearance

A UXO desk study and risk assessment (P10200-20-R1) procured by the client determined that the UXO risk for the site was Low.

4.4 Cable Percussion Drilling

10 No. Cable Percussion Boreholes (BH101 – BH110) were drilled to a maximum depth of 57.00m using a cable percussion rigs (Dando 1000, 2000 & 175) with 250mm, 200mm and 150mm diameter casing as appropriate.

BH102 was aborted at 0.80m depth due to presence of buried foundations, location was moved inside the datacenter building to position BH102A which was aborted again at 1.80m due to presence of mass concrete. BH102B was carried out through the WS216 inspection pit and was aborted at 3.06m depth on 06/09/21 due to a concrete obstruction. The borehole was redrilled with 250mm casing to allow for coring of the concrete obstruction to take place and continued drilling passed the obstruction on 28/09/2021. Borehole aborted at 22.50m depth due to presence of water that was unable to case off.

BH103 aborted at 1.10m depth due to presence of unidentified services and moved to position BH103A.

BH104 & BH104A were aborted at 1.70m and 1.50m depth respectively due to presence of a strong CAT signal. The borehole was moved to position BH104B to be aborted again at 0.73m depth due to presence of a concrete obstruction and possible services. BH104C was then moved and carried out from the base of IT501.

BH109 was advanced from the base of WS215.

Water seepages encountered during drilling in most boreholes. Seepages were unable to seal off due to water seeping under the casing in BH101, BH102, BH103, BH107, BH108 and BH110.

4.4.1 Sampling and Testing during Cable Percussion Drilling

Bulk samples were taken at regular intervals in the Made Ground and thereafter at each change in strata. Undisturbed Thin Walled samples (UT) alternating with 102mm (U100) were taken in accordance with EC7 using a down-hole sliding hammer in cohesive material were collected at regular intervals or as instructed by the Investigation Supervisor.

Standard Penetration Tests (SPT) were carried out at specified intervals or as otherwise instructed by the Investigation Supervisor. The resulting SPT “N” blowcount values are presented in the relevant borehole records. Where an SPT using a split spoon sampler was not possible, due to the granular nature of the material, a solid cone was used.

Small, disturbed samples were retrieved from the cutting shoe of the UT100 and U100 sampler, the SPT split spoon sampler and at intervals specified by the Investigation Supervisor.

Environmental samples (tubs, jars and vials) were taken for chemical analysis in the Made Ground or at each change of strata and where visual or olfactory evidence of contamination was noted or as instructed by the Investigation Supervisor. Headspace readings for volatile organic compound (VOC) content were taken in all of the samples using a Phocheck Tiger photoionization detector.

The borehole logs are presented in Section 8 of this report along with the SPT hammer certificates.

4.5 Dynamic Sampling Boreholes

18 No. Dynamic Sampling Boreholes (WS201-WS281A) were carried out to a maximum depth of 6.00m, scheduled to reach 1m into London Clay or aborted. The boreholes were drilled using a tracked Geo drive-tube sampling rigs.

WS05, WS07, WS07A, WS07B, WS18 and WS18A inspection pits were aborted at various depth due to presence of obstructions. WS216 inspection pit was used to advance BH102B.

Boreholes that didn't achieve the scheduled depth were aborted due to either refusal or collapsing.

Semi-rigid plastic core liners were recovered from each borehole location. The excavated soil was logged in accordance with BS 5930:2020.

Environmental samples (tubs, jars and vials) were taken for chemical analysis from the and inspection pits but also the liners of the boreholes. Headspace readings for volatile organic compound (VOC) content were taken using a Phocheck Tiger photoionization detector.

SPTs were carried out at the base of the inspection pit and thereafter at 1.00m intervals.

The borehole logs are presented in Section 9 along with the SPT hammer certificates.

4.6 Machine Excavated Trial Pits & Trial Trenches

11 No. Trial pits (TP301-TP310) were hand and machine excavated to a maximum depth of 3.10m using a JCB 3CX backhoe with extension arm. The pits were carried for geotechnical and geoenvironmental soil sampling, and building foundation assessment.

1 No Trial trench (TT401) split into the 3 segments (TT401A, TT401B & TT401C) was carried out to investigate the buried fuel tank and for geoenvironmental soil sampling.

Environmental samples (tubs, jars and vials) were taken for chemical analysis in the Made Ground or at each change of strata and where visual or olfactory evidence of contamination was noted or as instructed by the Investigation Supervisor. Headspace readings for volatile organic compound (VOC) content were taken in all of the samples using a Phocheck Tiger photoionization detector. Bulk samples were also taken for soils analysis. Large bulk samples were collected from TP304, bulking factor 1 was calculated for this pit.

The trial pits were logged and photographed and the trench was sketched. The logs, sketches and photographs are presented in Section 10 and Section 15 of this report.

4.7 Archaeological Watching Brief

An archaeological watching brief was carried out by MOLA (Museum of London Archaeology) in BH101-BH106 and TP303, TP305, TP307, TP308 and TP310. The archaeological report is presented in Appendix A of this report.

4.8 Permeability Tests

1 No. Machine excavated trial pit (IT501) was carried out to 2.20m depth to carry out soakaway test. Following excavations, the dimensions of the pit was recorded and water was rapidly pumped into the pit using a bowser. The water level was recorded at the start of the test and at regular intervals. The test results are presented in Section 11 of this report.

IT502 was abandoned due to the number of services in the area. No clear location could be identified. A falling head test was conducted in BH05 as requested by the Investigation Supervisor. The test results are presented in Section 11 of this report.

4.9 Standpipe Installations and Backfill

Monitoring wells were installed in the boreholes as follows:

Table 2 – Monitoring Installation Details

Hole ID	Base of Borehole (m bgl)	Diameter of Installation (mm)	Type of Installation	Base of Installation (m bgl)	Response Zone	
					Top (m bgl)	Bottom (m bgl)
BH101	57.00	50	GMP	1.00	0.50	1.00
		50	GWMP	18.00	9.50	18.00
BH102B	22.50	50	GWMP	5.07	3.07	5.07
		19	GWMP	22.50	21.50	22.50
BH103A	40.00	50	GWMP	11.70	1.20	11.70
BH104C	50.45	50	GWMP	6.00	2.00	6.00
BH105	48.50	50	GMP	1.20	0.50	1.20
		-	VWP	48.50	-	-
BH106	47.50	50	GMP	1.70	1.20	1.70
		50	GWMP	6.70	3.70	6.70
		-	VWP	45.00	-	-
BH107	49.50	50	GWMP	35.00	33.00	35.00
BH108	25.45	50	GWMP	9.00	2.00	9.00
		19	GWMP	16.00	15.00	16.00
BH109	25.00	50	GWMP	22.50	21.50	22.50
BH110	48.45	19	GWMP	34.00	33.00	34.00
WS201	3.00	50	GMP	1.40	0.40	1.40
WS204	1.60	50	GMP	1.20	0.50	1.20

Hole ID	Base of Borehole (m bgl)	Diameter of Installation (mm)	Type of Installation	Base of Installation (m bgl)	Response Zone	
					Top (m bgl)	Bottom (m bgl)
WS205A	4.00	50	GMP	3.00	2.40	3.00
WS206	4.00	50	GMP	2.00	0.50	2.00
WS207C	6.00	50	GMP	1.20	0.50	1.20
WS209	4.00	50	GWMP	3.55	2.00	3.55
WS213	4.00	50	GWMP	4.00	1.00	4.00
WS214	4.00	50	GMP	1.70	1.00	1.70

KEY
GMP – Gas and groundwater Standpipe
GWMP – Groundwater Standpipe
VWP – Vibrating Wire Piezometer

The boreholes were backfilled at the base with bentonite pellets with the gas/groundwater response zones backfilled with a 10mm pea shingle filter with a geosock surround. Where wires were installed, the boreholes were backfilled with cement / bentonite grout mix. All installations were finished with bentonite pellets to the surface with concrete and a lockable stopcock cover flush with the ground.

The boreholes with no installations were backfilled with bentonite pellets or bentonite cement / bentonite grout mix upon completion. The trial pits with soil arising and made good upon completion

4.10 Instrumentation Monitoring and Sampling

Monitoring was carried out during fieldworks and subsequent to completion of the boreholes on 6 No. scheduled visits between the 26/10/2021 and 01/12/2021 All visits were done over two consecutive days due to the large number of locations.

All boreholes were developed at least one week prior to sampling using a Wasp pump which provides a relatively high pumping rate to remove water and entrained sediment. Development continued until either the well ran dry, the water ran clear or at least 10 well volumes were removed.

Water samples were taken during 4 No visits between 02/11/2021 and 18/11/2021 from BH101, BH102B shallow and deep, BH103A, BH104C, BH106, BH108, WS205A, WS209, WS213 and from Yeading Downstream and Upstream. The samples were taken using a peristaltic pump at a low pumping rate. The pump tubing was lowered to target the standpipe response zone and a dipmeter was used during purging to ensure that the pumping rate did not reduce the water level. Generally, the water level remained steady at pumping rates of 1 litre every 3 minutes. Water parameters (pH, conductivity, dissolved oxygen, temperature and Redox levels) were recorded during purging using a flow cell and a YSI Professional Probe. Purging was considered complete when parameters stabilised to within 10%. Generally, the water was noted as clear and the purging complete after 3 litres were removed. On completion of purging, the water

samples were collected in containers (3x300ml and 3xvial). They were then transferred to Concept laboratory inside cool boxes protected by bubble wrap and kept in the fridge until collection from the chemical laboratory was arranged. Each borehole was purged and sampled using a new length of tubing.

Gas samples were collected during 6 No. between 02/11/2021 and 01/12/2021 from BH106, WS201, WS206, WS207C and WS214. Vapour samples were taken on 11/11/2021 and 24/11/2021 from BH06, WS206 and WS207C. Gas canister samples were collected using Tedlar bags or Flexfoil gas bags.

An In-Situ Rugged interface probe was used to prove/disprove the presence LNAPL and DNAPL. The gas concentrations were recorded using two Gas data GFM436 monitors. Where 0.00 is shown on the results indicates value lower than the detection limit of the machine. PID readings were taken during all monitoring rounds. The accuracy of the instruments is summarised in Section 12 where the gas monitoring reports and groundwater results are presented along with the instruments calibration sheets.

The vibrating wires were monitored using a Geosense G200 Vibrating Wire Readout unit and the results are presented in the same section.

4.11 Logging / Laboratory Testing

Logging of all soil samples was carried out in accordance with BS 5930:2020.

Geotechnical testing was performed at Concept Site Investigations laboratory in accordance with BS1377:1990 unless otherwise stated in the report. Concept is accredited by UKAS for tests where the UKAS logo is appended to the individual test report or summary. Approved signatories for laboratory testing are as follows:

- LG – Lynn Griffin (Quality Manager)
- KM – Kasia Mazerant (Laboratory Manager)

Where subcontracted analysis has been carried out, the details of the laboratory (and accreditation where applicable) are shown in the individual test report or summary.

The results are presented in tabular format in Section 13 of this report.

All chemical testing was specified and scheduled by Investigation Supervisor and carried out by Eurofins and i2 Analytical Ltd in accordance with the requirements of UKAS ISO17025 and MCERTS. The results are presented in tabular format in Section 14 of this report.

4.12 Setting Out

The locations of all exploratory holes were agreed with the Investigation Supervisor and set out prior to commencement of the site works.

Following completion of the ground works the locations and elevations of the boreholes and pits were established by Concept's specialist subcontractor JPP Surveying Ltd using total survey equipment with accuracy between +/- 2mm and 5mm and GPS equipment with an accuracy between +/- 10mm and 20mm.

The co-ordinates and levels of the as-built locations of the boreholes and pits are shown in the Exploratory Hole Location Plan presented in Section 7 of this report.

5. GEOLOGICAL GROUND PROFILE

The geological strata encountered during the investigation are summarised in the table below. The Top and Bottom of the strata noted in the table indicates the highest and lowest boundaries encountered in all exploratory holes.

Table 3- Geological Ground Profile

STRATUM	TOP (mOD)	BASE (mOD)	DESCRIPTION
MADE GROUND	+30.50	+25.68	Concrete/ Brickwork/ Asphalt over, Dark grey fine to coarse GRAVEL and COBBLES with rootlets and musk odour. Gravel and cobble are brick, asphalt and kerbstone fragments. Brown sandy clayey GRAVEL with medium cobble content and occasional pockets of dark grey clay. Gravel comprises angular to subrounded fine to coarse flint, brick, limestone, asphalt, granite, concrete, mortar and glass fragments. Dark brownish grey gravelly silty very clayey fine to coarse SAND with medium brick and concrete cobble content, occasional pockets of soft to firm, grey clay, rare roots and rootlets and wood fragments. Brown sandy very gravelly SILT with rootlets. Soft, brown slightly gravelly silty CLAY with medium brick cobble content, occasional pockets of soft, dark grey clay, roots and rootlets and musk odour.
(ALLUVIUM/ LYNCH HILL GRAVEL MEMBER?) *Encountered in BH101, BH107, BH108, BH109 & BH110*	+29.34	+19.68	Dense, brown clayey sandy subangular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. Medium dense, orangish brown gravelly silty fine to medium SAND with occasional pockets of grey silty clay. Soft to firm, brown mottled light greenish grey slightly gravelly silty CLAY with occasional partings of black organic matter, frequent pockets of brown, orangish brown and light bluish grey silt, occasional lenses of off-white silt, rare lignite fragments, reddish brown silt nodules, dark grey flecks, dark grey staining and medium strong hydrocarbon odour.

STRATUM	TOP (mOD)	BASE (mOD)	DESCRIPTION
LANGLEY SILT MEMBER	+29.62	+25.36	Soft to firm, dark grey slightly gravelly sandy SILT with slight hydrocarbon odour. Gravel is angular to subangular fine to medium flint. Firm, bluish grey mottled greenish brown and bluish grey sightly gravelly sandy silty CLAY with roots. Gravel is angular to subangular fine to coarse flint.
LYNCH HILL GRAVEL MEMBER	+29.77	+11.78	Medium dense, orange sandy silty angular to subrounded fine to coarse flint GRAVEL. Orangish brown mottled light brown gravelly silty fine to medium SAND with frequent pockets of light greenish brown clayey fine to medium sand and pockets of light brown very sandy clay. Firm, reddish brown gravelly sandy CLAY.
WEATHERED LONDON CLAY	+26.54	+11.08	Very stiff, brown mottled orangish brown and dark grey slightly gravelly slightly micaceous silty CLAY with frequent pockets of orangish brown silt and dark grey silt nodules. Gravel is angular to subrounded fine to coarse flint.
LONDON CLAY	+23.28	-18.22	Very stiff, extremely closely fissured greyish brown slightly sandy slightly micaceous silty CLAY with occasional partings and pockets of light brown and dark grey silty fine sand, rare partings and pockets of light grey silt, occasional lenses of white silt, rare shell fragments, white flecks, foraminifera, bioturbation and 1No pyrite nodule. Fissures are subhorizontal, planar, smooth, polished.
HARWICH FORMATION	-15.40	-19.92	Very stiff, grey slightly micaceous silty CLAY with frequent pockets of dark grey silty fine sand, off-white shell fragments and occasional bioturbation. Grey slightly sandy SILT.
LAMBETH GROUP	-15.82	Extent not proven	Very stiff, greyish brown grey mottled red, yellow and grey gravelly sandy silty CLAY with low limestone cobble content. Gravel is subangular medium to coarse limestone fragments.

REFERENCES

British Standards Institution, (2015) Code of practice for ground investigations, British Standard BS5930: 2020, BSI, London

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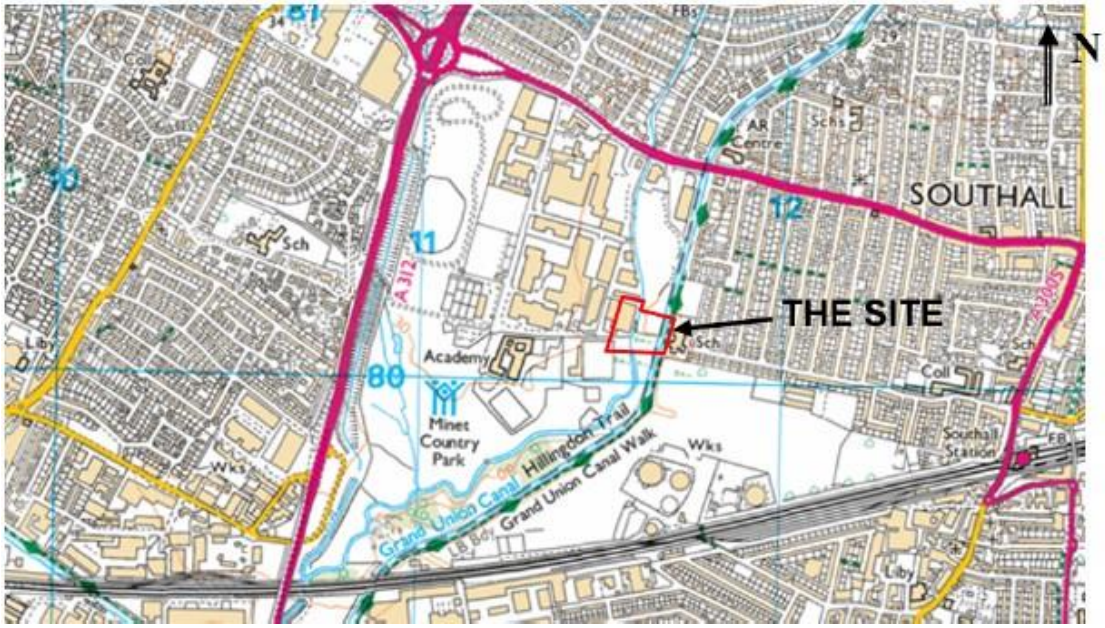
6. SITE LOCATION PLAN



Not to Scale / Map data ©2021 Google

7. EXPLORATORY HOLE LOCATION PLAN

Hole ID	Easting	Northing	Level (mOD)
BH101	511479.91	180275.05	29.68
BH102	511595.37	180211.83	29.01
BH102A	511586.27	180206.35	29.17
BH102B	511575.43	180194.67	29.18
BH103	511505.79	180225.51	29.69
BH103A	511506.31	180227.49	29.70
BH104	511500.93	180169.11	29.13
BH104A	511501.73	180167.53	29.13
BH104B	511498.63	180168.66	29.15
BH104C	511500.52	180144.85	29.28
BH105	511561.17	180129.27	28.54
BH106	511447.04	180152.91	29.70
BH107	511463.04	180236.67	29.68
BH108	511479.57	180188.55	29.79
BH109	511539.88	180208.41	29.17
BH110	511514.83	180265.33	29.60
IT501	511500.66	180144.11	29.32
	511501.15	180146.56	29.28
	511500.26	180146.69	29.30
	511499.69	180144.41	29.32
TP301	511495.41	180264.66	29.73
	511495.11	180264.14	29.73
	511494.64	180264.41	29.87
	511494.93	180264.93	29.87
TP302	511449.06	180139.45	29.88
	511449.02	180140.79	29.84
	511446.49	180140.82	29.85
	511446.41	180139.71	29.85
TP303	511510.82	180136.60	29.19
	511509.96	180136.72	29.21
	511509.25	180133.80	29.27
	511510.24	180133.60	29.25
TP304	511472.24	180133.80	29.65
	511472.14	180132.63	29.60
	511474.59	180132.16	29.61
	511475.26	180133.32	29.64
TP305	511555.60	180220.32	29.00
	511555.72	180220.76	29.00
	511556.57	180220.53	29.00
	511556.46	180220.10	29.00
TP306	511560.21	180140.77	28.88
	511559.53	180140.97	28.87
	511559.28	180140.13	28.87
	511559.96	180139.93	28.88
TP307	511514.45	180198.16	29.01
	511514.30	180197.57	29.01
	511514.88	180197.42	29.01
	511515.03	180198.01	29.01
TP308	511453.14	180193.75	30.59
	511453.04	180193.21	29.75
	511453.63	180193.10	29.75
	511453.73	180193.65	30.59
TP309	511468.98	180255.26	30.46
	511469.57	180255.13	30.46
	511469.77	180256.06	30.53
	511469.19	180256.19	30.53
TP309A	511471.11	180255.04	29.79
	511471.39	180255.80	29.78
	511470.43	180256.09	29.79
	511470.19	180255.25	29.80
TP310	511588.59	180171.76	29.11
	511588.38	180170.98	29.12
	511588.81	180170.86	29.12
	511589.03	180171.64	29.11
TT401A	511548.44	180133.60	28.72
	511552.07	180132.95	28.63
	511551.77	180130.35	28.66
	511550.45	180130.35	28.68
	511550.21	180131.52	28.67
	511548.29	180132.38	28.70
TT401B	511553.25	180135.54	28.68
	511553.93	180137.89	28.80
	511550.82	180138.80	28.88
	511550.77	180135.95	28.76
TT401C	511545.29	180136.23	28.86
	511545.58	180137.98	28.89
	511546.24	180137.90	28.91
	511545.92	180136.08	28.85
WS201	511483.49	180235.93	29.79
WS202	511516.97	180264.71	29.64
WS203	511533.28	180226.84	29.02
WS204	511517.48	180213.36	28.91
WS205	511585.38	180150.73	28.86
WS205A	511587.03	180157.88	28.95
WS206	511549.77	180141.08	28.98
WS207	511542.45	180125.26	28.83
WS207A	511543.55	180130.20	28.78
WS207B	511547.35	180129.60	28.71
WS207C	511541.91	180130.64	28.86
WS208	511504.32	180149.42	29.16
WS209	511470.12	180163.81	29.81
WS210	511451.84	180167.31	29.78
WS211	511475.00	180197.97	29.74
WS212	511464.63	180226.85	29.79
WS213	511511.17	180132.70	29.26
WS214	511554.73	180203.21	29.18
WS215	511539.88	180208.41	29.17
WS216	511574.77	180194.93	29.18
WS217	511523.14	180155.38	29.61
WS218	511567.29	180155.80	28.93
WS218A	511567.52	180156.72	28.92
Yeading Brook Downstream	511588.00	180079.00	N/A
Yeading Brook Upstream	511610.00	180212.00	N/A

CONCEPT

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North (indicative)

KEY

- BH - Aborted Borehole Location
- BH - Cable Percussion Borehole
- IT - Infiltration Trench
- TP - Trial Pit
- TT - Trial Trench
- WS - Dynamic Sampling Borehole
- Yeading Brook Water Sample

NOTES

1. Coordinates and levels quoted refer to Ordnance Survey (OS) National Grid.
2. Base drawing provided by ARUP, with drawing number DCS20109-ARUP-DM-CO-XX-DR-C-98200-BOUND.
3. This drawing should not be scaled.
4. All levels are in mOD (metres above Ordnance Datum).
5. Water sample coordinates are approximate.

ISSUES

Revision	Details	By	Date
00	Drawing completed and corrected	AC	01/12/21
01	Yeading Brook Water Samples added to drawing	AC	03/02/22

Client: HDCI Hayes London Limited

Project: L4 Colt DCS Data Centre

Address: Springfield Industrial Estate Middlesex 0SL, Beaconsfield Rd, Hayes UB4 0SL

Plan title: Exploratory Hole Location Plan

Project no: 21/3600	Drawing no: 01	Revision: 01	
Scale: NTS	Sheet size: A3 (297.00x420.00mm)		
Date: February 2022	Status: Issue		
Surveyed by: JPP	Drawn by: AC	Checked by: CS	Passed by: OS

8. CABLE PERCUSSION BOREHOLE LOGS

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Telephone: 02088112880_
E-mail: si@conceptconsultants.co.uk

Borehole No

BH101

Project

L4 Colt DCS Data Centre

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
21/3600	16/08/21	29.68	E 511479.91 N 180275.05	57.00m
	Date Completed 24/08/21			

Client

HDCI Hayes London Limited

BOREHOLE SUMMARY

Top (m)	Base (m)	Type	Date Started	Date Ended	Crew	Logged By	Barrel Type	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	1.20	IP	11/08/2021	11/08/2021	DJ	FT/ AN			Hand Excavated	
1.20	57.00	CP	16/08/2021	13/08/2021	DJ	AN			Dando 2000	AR3552

WATER STRIKES

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)
9.50	3.70	20	8.00	

WATER ADDED

From (m)	To (m)
1.20	6.00
10.00	18.00

CHISELLING / SLOW DRILLING

From (m)	To (m)	Duration (hr)	Remarks
45.50	46.00	01:00	Claystone
55.00	56.00	02:00	Slow drilling
56.00	57.00	02:00	Slow drilling

HOLE

Depth (m)	Diameter (mm)
0.00	250
10.00	250
43.50	200
57.00	150

CASING

Depth (m)	Diameter (mm)
0.00	250
10.00	250
18.00	200
44.00	150

DYNAMIC SAMPLING /ROTARY RECOVERY

From (m)	To (m)	Duration (hr)	Recovery (%)

ROTARY FLUSH DETAIL

From (m)	To (m)	Flush Type	Flush Return (%)	Flush Colour

INSTALLATION DETAILS

Type	Diameter (mm)	Depth of Installation (m)	Top of Response Zone (m)	Bottom of Response Zone (m)	Date of Installation
GMP	50	1.10	0.50	1.00	24/08/2021
GWMP	50	18.00	9.50	18.00	24/08/2021

BACKFILL DETAILS

Top (m)	Bottom (m)	Material	Backfill Date	Remarks
0.00	0.20	Concrete	24/08/2021	Flush Cover
0.20	0.50	Bentonite Pellets		
0.50	1.00	Pea Shingle		
1.00	9.50	Bentonite Pellets		
9.50	18.00	Pea Shingle		
18.00	20.00	Bentonite Pellets		
20.00	57.00	Cement/Bentonite Grout		

Issue: FINAL	CHD: AN	APRV: OS	Log Print Date & Time: 07/02/2022 18:14	AGS

CONCEPT
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W3 0RF
Telephone: 02088112880_
E-mail: si@conceptconsultants.co.uk

Borehole No

BH101

Project

L4 Colt DCS Data Centre

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
21/3600	16/08/21	29.68	E 511479.91 N 180275.05	57.00m
	Date Completed 24/08/21			

Client

HDCI Hayes London Limited

PROGRESS

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks
11/08/21	0.00		Dry	
11/08/21	1.20		Dry	
16/08/21	1.20		0.60	... Water Added
16/08/21	4.00	4.00	2.10	
16/08/21	5.50	5.50	3.00	
16/08/21	8.45	7.10	7.30	
17/08/21	8.45	7.10	5.20	
17/08/21	9.50	8.00	9.50	... Water Strike
17/08/21	10.00	10.00	9.50	... Water Added
17/08/21	10.50	10.00	4.00	
17/08/21	12.00	11.50	4.50	
17/08/21	13.50	13.00	3.70	
17/08/21	15.00	14.50	4.00	
17/08/21	16.50	16.00	4.30	
17/08/21	17.90	17.50	5.50	
17/08/21	24.45	18.00	22.00	
18/08/21	24.45	18.00	18.00	
18/08/21	25.50	18.00	25.00	
18/08/21	39.00	18.00	38.50	
18/08/21	40.95	18.00	40.00	
19/08/21	40.95	18.00	40.00	
19/08/21	41.50	18.00	38.80	
19/08/21	43.00	18.00	40.00	
19/08/21	44.00	43.50	42.90	
19/08/21	46.00	44.00	43.50	
19/08/21	49.85	44.00	43.50	
20/08/21	49.85	44.00	22.00	
20/08/21	50.00	44.00	23.50	
20/08/21	51.50	44.00	25.70	
20/08/21	52.20	44.00	26.10	
20/08/21	53.80	44.00	26.70	
20/08/21	55.45	44.00	27.10	
23/08/21	55.45	44.00	49.00	
23/08/21	55.50	44.00	6.50	
23/08/21	57.00	44.00	6.90	

SPT DETAILS

Type	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
C	1.20	N39	1, 2 / 2, 3, 9, 25		0.60
C	2.50	N48	4, 4 / 8, 9, 15, 16	2.50	1.50
C	4.00	N31	2, 2 / 5, 8, 8, 10	4.00	2.10
C	5.50	N20	2, 2 / 3, 5, 6, 6	5.50	3.00
S	8.00	N22	3, 4 / 5, 5, 5, 7	7.10	7.30
S	9.50	N28	7, 10 / 6, 4, 8, 10	7.10	3.90
C	10.00	N19	2, 3 / 5, 4, 5, 5	10.00	4.00
C	11.50	N16	2, 3 / 3, 4, 4, 5	11.50	4.50
C	13.00	N16	3, 5 / 3, 5, 4, 4	13.00	3.70
C	14.50	N20	3, 3 / 4, 4, 4, 8	14.50	4.00
C	16.00	N2	1, 0 / 0, 1, 0, 1	16.00	4.30
C	17.50	N1	1, 0 / 0, 1, 0, 0	17.50	5.50
S	19.50	N27	3, 4 / 6, 6, 7, 8	18.00	10.50
S	21.00	N29	3, 4 / 6, 7, 7, 9	18.00	19.40
S	22.50	N31	4, 5 / 7, 7, 8, 9	18.00	20.00
S	24.00	N33	4, 4 / 6, 8, 9, 10	18.00	22.00
S	25.50	N30	12, 6 / 5, 6, 9, 10	18.00	25.00
S	27.00	N34	4, 5 / 6, 8, 9, 11	18.00	26.50
S	28.50	N33	3, 6 / 7, 7, 8, 11	18.00	28.00
S	30.00	N32	3, 5 / 6, 7, 9, 10	18.00	29.50
S	31.50	N36	4, 5 / 8, 8, 10, 10	18.00	31.00
S	33.00	N75	6, 19 / 39, 13, 12, 11	18.00	32.50
S	34.50	N41	4, 4 / 9, 10, 10, 12	18.00	34.00
S	36.00	N43	5, 6 / 10, 10, 10, 13	18.00	35.50
S	37.50	N36	4, 6 / 8, 9, 9, 10	18.00	37.00
S	39.00	N36	4, 5 / 7, 8, 10, 11	18.00	38.50
S	40.50	N40	4, 6 / 8, 9, 11, 12	18.00	40.00
S	42.00	N40	4, 7 / 8, 9, 11, 12	18.00	38.90
S	43.40	N42	4, 7 / 9, 9, 12, 12	18.00	40.00
S	45.00	N46	4, 8 / 10, 10, 12, 14	44.00	42.90
S	46.00	N48	3, 7 / 9, 10, 13, 16	44.00	43.50
S	47.50	N51	6, 7 / 9, 13, 13, 16	44.00	41.20
S	49.40	N43	5, 6 / 8, 10, 12, 13	44.00	43.50
S	50.90	N56	4, 8 / 12, 13, 15, 16	44.00	23.50
S	52.20	N67	5, 8 / 12, 15, 20, 20	44.00	26.10
S	54.10	N60	7, 10 / 10, 14, 16, 20	44.00	26.70
S	55.00	N50	4, 6 / 8, 10, 15, 17	44.00	27.10
S	56.40	N100/245	15, 10 / 23, 27, 39, 11	44.00	6.90

GENERAL REMARKS

1. Borehole is blowing in the gravels.
2. Water seepage encountered at 9.50m depth, rising to 5.80m (5 mins), 4.70m (10 mins), 4.00m (15 mins) and 3.70m (20 mins).
3. Unable to seal off the water. Water kept seeping in under the casing.

KEY

SAMPLES

ES - Environmental Sample (Tub, Vial, Jar) AZCL:Assumed Zone of Core Loss
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample, LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

INSTALLATION DETAILS

GMP - Gas monitoring point
GWMP - Groundwater monitoring point
SPIE - Standpipe piezometer
EPIE - Electronic Piezometer
SP - Standpipe

HOLE TYPES

IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling /Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

TESTS S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer, MP-Mackintosh Probe, VOC-Volatile Organic Compounds

Note: All depths are in metres, all diameters in millimetres, water strike rise time in minutes. For details of abbreviations see Key

Issue: FINAL	CHD: AN	APRV: OS	Log Print Date & Time: 07/02/2022 18:14	AGS