PROJECT NOMA PLOT P

FACTUAL REPORT ON GROUND INVESTIGATION

Report No A9023-19

February 2020

Issue No 2

Carried out for:
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		SIGNATURE	SIGNATURE	SIGNATURE

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1 INTRODUCTION

SOCOTEC UK Limited was commissioned in August 2019 by Buro Happold Engineering (BHE), on behalf of Gardiner & Theobald LLP (G&T), to carry out a ground investigation for Project NOMA, Plot P. The investigation was required to obtain information for a proposed new multi storey commercial building project, including basements.

The scope of the investigation was specified by BHE and comprised boreholes, trial pits, concrete coring, in situ testing, monitoring, laboratory testing and reporting. The investigation was performed in accordance with the contract specification, and the general requirements of BS 5930 (2015), BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork took place between 30 September and 17 October 2019.

This report presents the factual records of the fieldwork, monitoring and laboratory testing completed to date. The information is also presented as digital data as defined in AGS (2017).

2 SITE SETTING

2.1 Location and Description

The site is located approximately 0.5 km from Manchester City Centre and approximately 200 m to the east of Manchester Victoria Railway Station, centred at National Grid reference SJ 843 991, see Site Location Plan in Appendix A.

The site is bounded to the north and west by the A664 and to the east by Beswick Row Street. Adjacent to the site is Miller Street toward the southwest which runs northwest to southeast. The site is located within two existing live car parks with some of the exploratory hole locations inside an existing internal basement. The site is gently sloping downhill from east to west, with an approximate difference in height of 4 m from the highest point to the lowest.

2.2 Published Geology

The published geological map for the area, (BGS Sheet 85, 2011), and the BGS GeoIndex Onshore online viewer (2018) show the site is located on Glacial Till with the underlying bedrock comprising of sandstones belonging to the Chester Formation of Triassic age .

3 FIELDWORK

3.1 General

The exploratory hole locations were selected by BHE and set out from local features. The co-ordinates and ground levels of the positions were surveyed by SOCOTEC to National Grid and Ordnance Datum using GPS techniques, and are shown on the Site Plan in Appendix A. The positions of observation pits HTP3 and HTP4, plus Concrete Cores CC03 and CC04, were not able to be surveyed using GPS techniques due to being located inside an existing internal basement. These are shown on the Site Plan as approximate locations measured in from existing features.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 1 : SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	DEPTH RANGE (m)	REMARKS
Dynamic Sampler boreholes extended by Rotary Core Drilling	4	28.00	BH01 to BH04
Trial Pits (Machine Dug)	7	3.10	MTP1 to MTP8
Trial Pits (Hand Dug)	3	1.10	MTP06, HTP03 and HTP04
Horizontal Masonry/Concrete Coring	2	1.55	CC03 and CC04

Two additional hand excavated trial pits (HTP01 and HTP02) plus two concrete cores (CC01 and CC02) were omitted from this phase of the investigation, due to access restrictions into the adjacent building.

The exploratory hole logs are presented in Appendix B. These include descriptions of the strata encountered together with details of the equipment and methods used, sampling and field testing carried out, water depths and other field observations. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, along with other explanatory information. Soil and rock material descriptions are in accordance with BS EN ISO 14688-1 (2018), BS EN ISO 14689 (2018) and the guidance of BS 5930 (2015).

Standard penetration tests (SPT) in the boreholes were carried out in accordance with BS EN ISO 22476-3+A1 (2011) and the SPT hammer energy ratio certificate is included in Appendix B. The results are presented on the logs as uncorrected N values.

On completion of the fieldwork, geotechnical samples were transported to the Carcroft office of SOCOTEC for temporary retention, with those required for testing being transferred to the SOCOTEC laboratory at Carcroft, near Doncaster. Geoenvironmental samples were transported from site directly to the SOCOTEC laboratory at Bretby, near Burton-on-Trent.

Photographs of the trial pits, rotary drilled cores and concrete cores are presented in Appendix F.

3.3 Groundwater and Gas Monitoring

Gas and groundwater monitoring instrumentation were installed in all boreholes, as specified by BHE; details are shown on the logs and summarised in Appendix C. Records of monitoring carried out by SOCOTEC during and after the fieldwork period are presented in Appendix C and summarised in the table overleaf.

TABLE 2 : SUMMARY OF MONITORING

TYPE	QUANTITY	REMARKS
Gas and Groundwater Monitoring Post Fieldwork Visit	6	Visits were carried out on 25 October 2019, 7 November 2019, 22 November 2019, 6 December 2019, 20 December 2019 and 6 January 2020.

4 LABORATORY TESTING

4.1 Geotechnical Testing

Geotechnical laboratory testing was scheduled by BHE and was carried out in accordance with BS 1377 (1990), BS EN ISO 17892 (2014) Part 1 and 2 and ISRM (2007) unless otherwise stated within the test report. The testing is summarised below and the results are presented in Appendix D.

TABLE 3 : SUMMARY OF GEOTECHNICAL LABORATORY TESTING

TYPE	QUANTITY	REMARKS
pH and Water Soluble Sulphate Content of Soils	9	Test methods are BS 1377 or others recognised in BRE Special Digest 1 (2005); they are indicated on the results report sheets in Appendix D.
Point Load Index Testing of Rock	19	
Uniaxial Compressive Strength of Rock	4	

4.2 Geoenvironmental Testing

Geoenvironmental laboratory testing was scheduled by BHE on the soil samples recovered during the fieldwork. The testing is summarised in the table below and the results are presented in Appendix E.

TABLE 4 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING

TYPE	QUANTITY	REMARKS
Suite 1 (Made Ground)	7	
Suite 2 (Natural)	2	
Full WAC	7	

5 REFERENCES

AGS : 2017 : Electronic transfer of geotechnical and geoenvironmental data (Edition 4.0.4 February 2017). Association of Geotechnical and Geoenvironmental Specialists.

BGS England and Wales Sheet 85 : 2011 : Manchester. 1:50000 geological map (solid and drift) (Bedrock and Superficials). British Geological Survey.

BGS GeoIndex Onshore : 2018. www.bgs.ac.uk. British Geological Survey.

BRE Special Digest 1 : 2005 : Concrete in aggressive ground. Building Research Establishment.

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2 : 2007 : Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS EN ISO 14688-1:2018 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description.

BS EN ISO 14688-2:2018 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification.

BS EN ISO 14689:2018 : Geotechnical investigation and testing - Identification and classification of rock - Part 1 Identification and description.

BS EN ISO 17892-1 : 2014 : Geotechnical investigation and testing – Laboratory Testing of soil – Determination of water content.

BS EN ISO 17892-2 : 2014 : Geotechnical investigation and testing – Laboratory Testing of soil – Determination of bulk density.

BS EN ISO 22475-1 : 2006 : Geotechnical investigation and testing – Sampling methods and groundwater measurements - Part 1 Technical principles for execution. British Standards Institution.

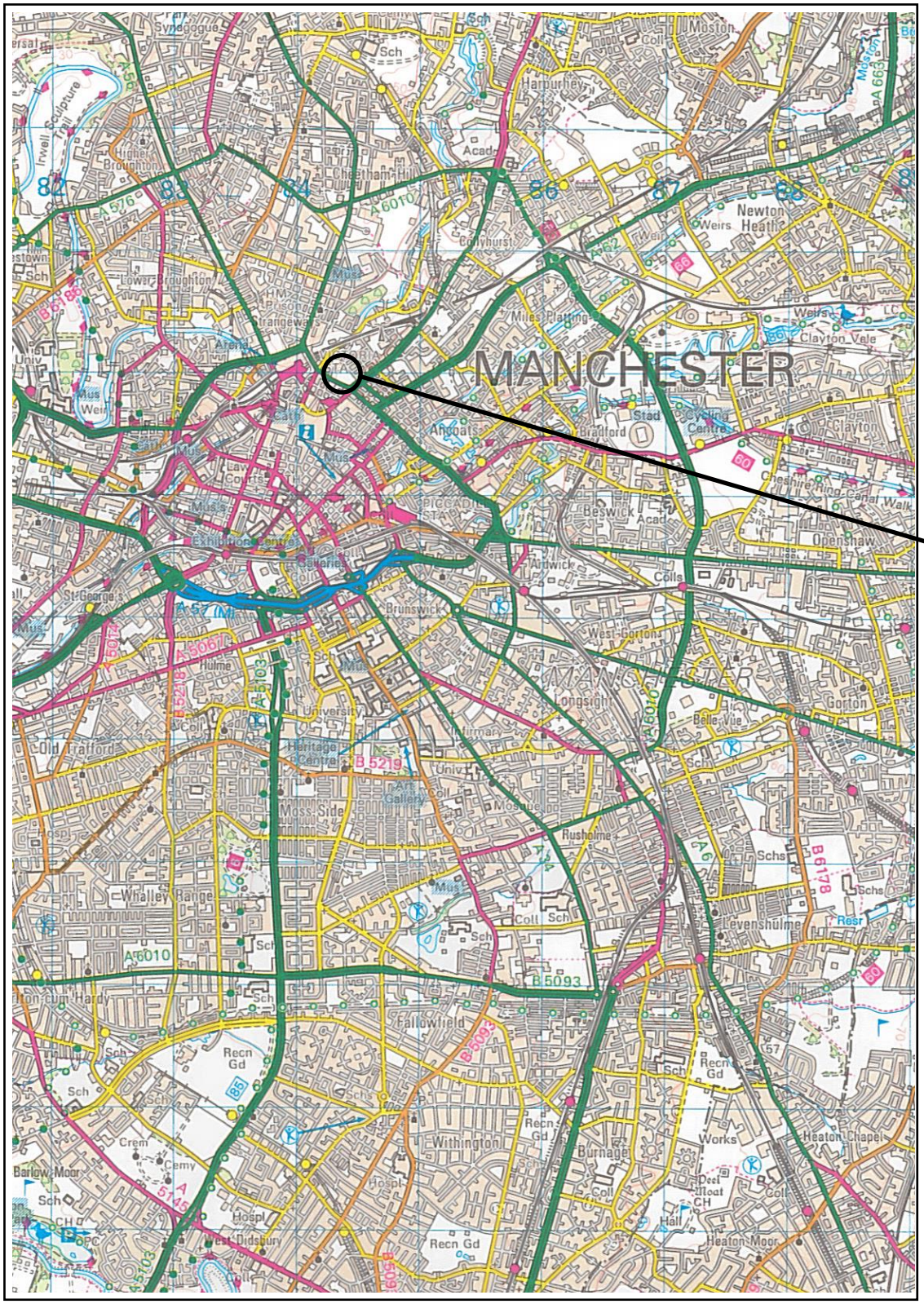
BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

ISRM : 2007 : The Complete ISRM Suggested Methods for Rock Characterisation, Testing and Monitoring (1974-2006). Commission on Testing Methods, International Society for Rock Mechanics (Editors Ulusay R & Hudson JA).

APPENDIX A
FIGURES AND DRAWINGS

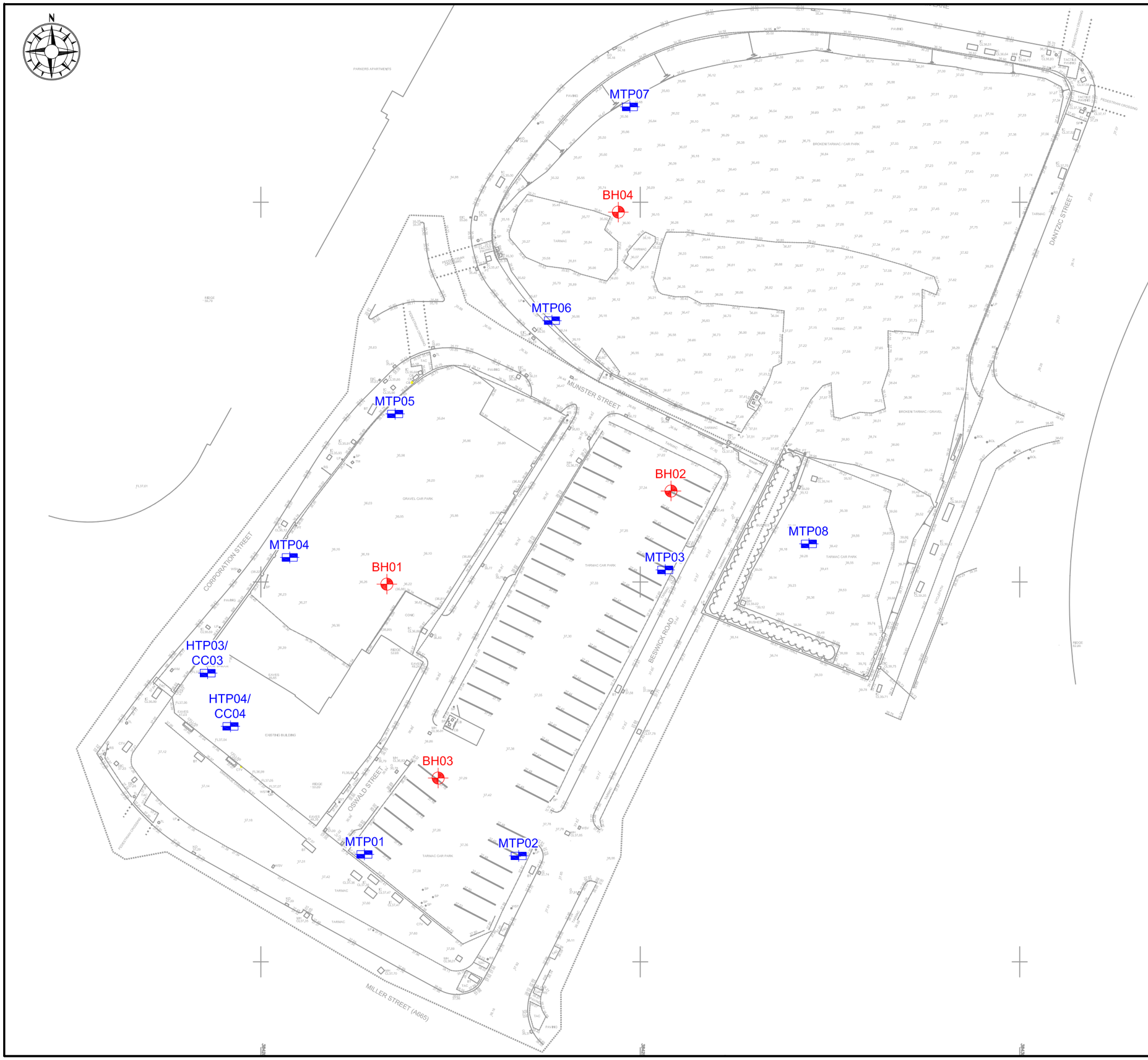
Site Location Plan	A1
Site Plan	A2

Site Location Plan



Reproduced from the 2013 Ordnance Survey 1:50 000 scale Landranger map No 110 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, © Crown copyright, SOCOTEC UK Limited. All rights reserved. Licence Number 100006060

Notes: Scale 1:50 000	**Project** PROJECT NOMA PLOT P **Proiect No.** A9006-19 **Carried out for** Buro Happold	**Figure** **A1**



GENERAL NOTES

1. Reproduced from Survey Operations Drawing No. 18J248/001.
2. Hole Locations to National Grid Co-ordinate Reference System.

LEGEND TO SYMBOLS

Borehole

Trial Pit

Scale: 1:500

0 5m 10 15 20 25

x	x	x	x	x	x
Rev	Drawn	Date	Approv.	Date	Modification Details

AMENDMENTS

Title

SITE PLAN

Project

PROJECT NOMA PLOT P
GROUND INVESTIGATION

Client

GARDINER & THEOBALD LLP

SOCOTEC

Date	Drawn By	Approv. By
21/11/2019	BS	MS

Sheet Size	Scale	Project No
A3	1:500	A9023-19

Drawing No	Rev
A2	0

APPENDIX B
EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records	Key
SPT Hammer Energy Ratio Report	SPT Hammer Reference SC01
Borehole Logs	BH01 to BH04
Trial Pit Logs	HTP03 and HTP04, MTP01 to MTP08
Concrete Core Logs	CC03 and CC04

Key to Exploratory Hole Records

SOCOTEC

SAMPLES

Undisturbed

U	Driven tube sample	nominally 100 mm diameter and full recovery unless otherwise stated
UT	Driven thin wall tube sample	
TW	Pushed thin wall tube sample	
P	Pushed piston sample	
L	Liner sample from dynamic (windowless) sampling. Full recovery unless otherwise stated	
CBR	CBR mould sample	
BLK	Block sample	
C / CS	Core sample (from rotary core) taken for laboratory testing.	
AMAL	Amalgamated sample	

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments

Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that, while an attempt was made to take a tube sample, there was no recovery.

Samples taken from borehole installations (ie water or gas) after hole construction are not shown on the exploratory hole logs.

Specimens for point load testing undertaken on site (or other non-lab location) are not shown on the log.

IN SITU TESTS

SPT S or SPT C — Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3:2005+A1:2011.
The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self-weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 the total blow count beyond the seating drive is given (without the N = prefix).

IV	*in situ* vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Permeability tests (KFH = falling head, KRH = rising head; KPI = packer inflow); results provided in Field Records column (one value per stage for packer tests)

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930:2015

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacing measurements are presented.
NI	Non-intact - used where the core is fragmented (ie no Solid Core).
NA	Not-applicable - used where a measurement is not applicable (eg. If, SCR and RQD in non-rock materials).

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered in the following run (length in m)
AZCL	Assessed zone of core loss

GROUNDWATER

▼	Groundwater entry
▽	Depth to groundwater after standing period

Key to Exploratory Hole Records

INSTALLATION Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

Standpipe/ piezometer The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer

Plain Pipe 

Slotted Pipe 

Piezometer Tip 

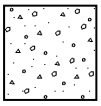
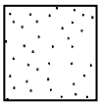
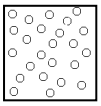
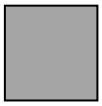
Inclinometer or Slip Indicator The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

ICE The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:
ICM Biaxial inclinometer
SLIP Inclinometer tubing for use with probe
Slip indicator

Settlement Points or Pressure Cells The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column. The type of instrument installed is indicated by a code in the Legend column:

ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
EPCE	Electronic embedment pressure cell
PPCE	Electronic push in pressure cell

INSTALLATION / BACKFILL LEGENDS A legend describing the installation is shown in the rightmost column. Legend symbols used to describe the backfill materials are indicated below.

Macadam 
Concrete 
Grout 
Bentonite 
Sand 
Gravel 
Arisings 

STRATUM LEGENDS The legend symbols used for graphical representation of soils, rocks and other materials on the borehole logs are shown below. For soils with significant proportions of secondary soil types, a combination of two or more symbols may be used.

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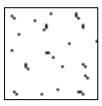
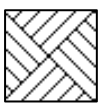
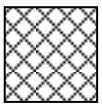
Concrete 
Topsoil 
Made Ground / Fill 
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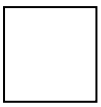
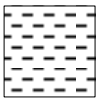
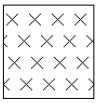
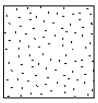
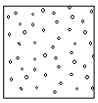
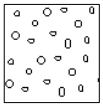
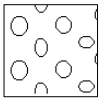
Void or No Information 

Clay 
Silt 
Sand 
Gravel 
Cobbles 
Boulders 
Coal 

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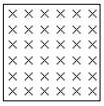
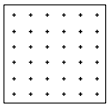
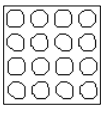
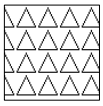
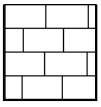
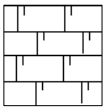
Siltstone 
Sandstone 
Conglomerate 
Breccia 
Limestone 
Chalk 

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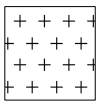
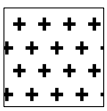
Igneous (Med) 
Igneous (Coarse) 
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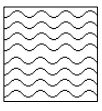
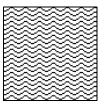
Metamorphic (Med) 
Metamorphic (Coarse) 
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Notes:

See report text for full references of standards.

Updated October 2018

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Key

Key to Exploratory Hole Records

SOCOTEC

NOTES

1 Soils and rocks are described in accordance with BS EN ISO 14688-1:2018 and 14689-1:2018 respectively and the guidance of BS 5930:2015.

2 For fine soils, consistency determined during description is reported for those strata where undisturbed samples are available. Where the logger considers that the sample may not be representative of the condition in situ, for whatever reason, the reported consistency is given in brackets. The reliability of the sample is indicated by Probably or Possibly as appropriate. Hence (Probably firm) indicates the logger is reasonably confident of the assessment, but (Possibly firm) means less certainty. Where the samples available are too disturbed to allow a reasonable assessment of the in situ condition, no consistency is given.

3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs. However, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

4 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

5 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures.

6 Observations of discernible groundwater entries during the advancement of the exploratory hole are given at the foot of the log and in the Legend column. The absence of a recorded groundwater entry should not, however, be interpreted as a groundwater level below the base of the borehole. Under certain conditions groundwater entry may not be observed, for instance, drilling with water flush or overwater, or boring at a rate faster than water can accumulate in the borehole. Similarly, where water entry observations do exist, groundwater may also be present at higher elevations in the ground than where recorded in the borehole. In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

7 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

REFERENCES

1 BS EN ISO 14688-1:2018 : Geotechnical investigation and testing - Identification and classification of soil. Part 1 Identification and description. British Standards Institution

2 BS EN ISO 14689-1 : 2018 : Geotechnical investigation and testing - Identification and classification of rock. Part 1 Identification and description. British Standards Institution

3 BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing. Part 3 Standard penetration test. British Standards Institution

4 BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution



Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
5-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	SC01
Test Date:	20/05/2019
Report Date:	20/05/2019
File Name:	SC01.spt
Test Operator:	TP

Instrumented Rod Data

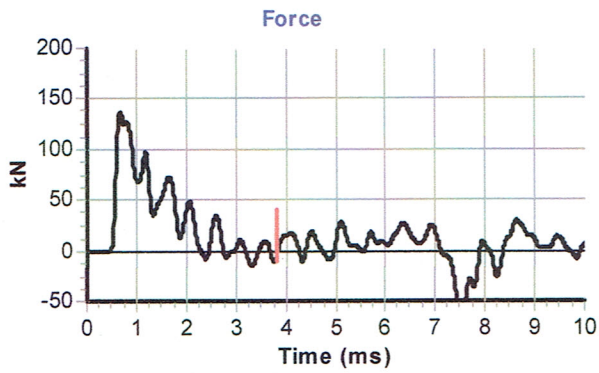
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	9603
Accelerometer No.2:	6457

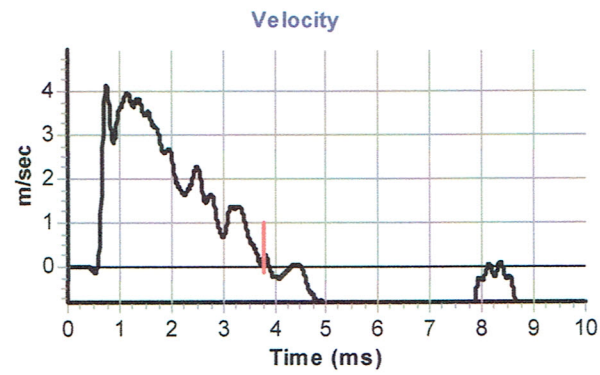
Hammer Information

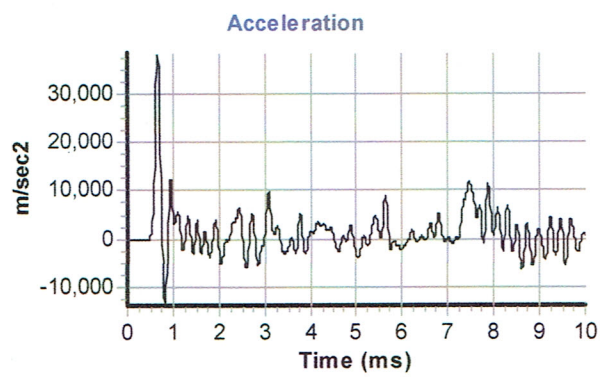
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

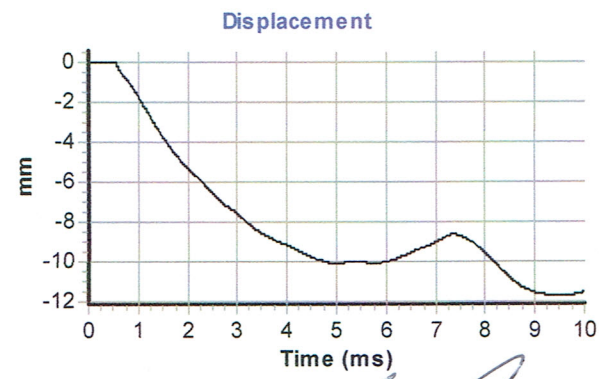
Comments / Location

Rotory hammer tested at Dynamic samplings yard.





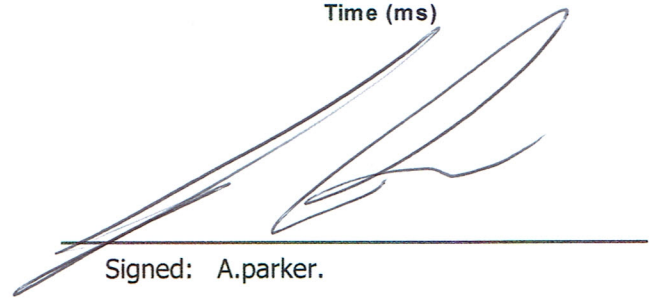




Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	372

Energy Ratio E_r (%): **79**



Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

SPTMAN ver.Hammer Energy ver. 1.93 All rights reserved, Testconsult ©2010

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**		**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**		36.29 mOD
Logged	JH		10/10/2019	Comacchio Geo 205.	1.20	2.00	115	2.00	**Coordinates (m)**		E 384216.61
Checked	MS	**End**		Dynamic sampling followed by rotary core drilling (PWF and HWF size) using water flush.	2.00	3.00	97	3.00	**National Grid**		N 399049.72
Approved	MS		17/10/2019	SPT Hammer ID: SC01, Rod type: NWY.	3.00	5.00	77	5.00			
					5.00	20.00	121	12.00			
					20.00	28.00	99	22.00			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 - 0.45	B 3		0.00-1.20 Hand excavated inspection pit.			Black sandy angular to rounded fine to coarse GRAVEL of roadstone, slag, brick, coal and macadam. (MADE GROUND)		(0.45)		
0.20	ES 1							0.45 +35.84		
0.20	D 2					Multicoloured slightly sandy gravelly CLAY with high cobble content. Gravel is angular fine to coarse of brick. Cobbles are angular of brick. Some rare sandstone cobbles. (MADE GROUND)		(1.10)		
0.50	ES 4									
0.50	D 5									
0.50 - 1.20	B 7									
1.00	ES 6									
1.00	D 8									
1.20 - 1.65	SPTS		N=2 (1,0/1,0,1,0)		Dry					
1.20 - 2.00	L		81% rec, diameter 115mm							
1.50	ES 9							1.55 +34.74		
1.55 - 2.00	B 10					Very loose yellowish brown and grey sandy slightly clayey rounded to subrounded fine to coarse GRAVEL of sandstone and mudstone with frequent lenses of purple and red sand. Sand is medium. Strong hydrocarbon odour. (Possible MADE GROUND)				
2.00 - 2.45	SPTS		N=3 (2,2/1,1,1,)	2.00	Dry					
2.00	ES 11									
2.00 - 3.00	L		100% rec, diameter 97mm					(1.45)		
2.50	ES 13									
2.50	D 12									
2.60 - 3.00	B 14									
3.00 - 3.45	SPTS		N=28 (4,4/6,6,8,8)	3.00	Dry			3.00 +33.29		
3.00	ES 15					Medium dense orangish brown, mottled black, red and purple slightly gravelly silty fine SAND. Gravel is rounded fine of sandstone. Strong hydrocarbon odour. (Possible MADE GROUND)				
3.00 - 4.00	L		100% rec, diameter 77mm					(1.00)		
3.50	D 16									
3.50 - 4.00	B 17									
4.00 - 4.23	SPTS		50 (2,5/42,8 for 8mm)	4.00	Dry	Dense red fine SAND Residual bedrock. Description based on SPT sample.		4.00 +32.29		
								(1.00)		
5.00 - 5.14			50 (25 for 75mm/50 for 65mm)	5.00	Dry	Assessed zone of core loss. Core loss due to fine SAND. (Completely weathered SANDSTONE)		5.00 +31.29		
5.00			D 18					(0.50)		
	61 24 17									
5.00 - 6.00						Extremely weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Distinctly to highly weathered with loss of strength and colour penetration at joints 2-3mm. Fractures are 0 to 5 degree, very closely to closely spaced, undulating, stepped with locally clayey sand infill.	5.80 1no. joint 20 degree undulating smooth clean. Joint set is very widely spaced.	5.50 +30.79		
5.70			ES 19							
		NI 65 170	Flush: 5.00 - 7.50 Water 0%							
	57 17 7									
6.00 - 7.50										
				10/10/19 5.00	1800 Dry					
				11/10/19 5.00	0800 5.80		7.40 becoming slightly gravelly. Gravel is rounded fine of quartz 7.50-7.90 AZCL			
	73 43 35							(5.00)		
7.50 - 9.00							8.25 tabular mudstone inclusion			
		NI 70 130								
			Flush: 7.50 - 10.50 Water 20%							
	92 74 44									
9.00 - 10.50										

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 28.00	No groundwater encountered during drilling.

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:44

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH01

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	10/10/2019
Logged	JH	**End**	17/10/2019
Checked	MS		
Approved	MS		

Equipment, Methods and Remarks

Comacchio Geo 205.
Dynamic sampling followed by rotary core drilling (PWF and HWF size) using water flush.
SPT Hammer ID: SC01, Rod type: NWY.

Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)
1.20	2.00	115	2.00
2.00	3.00	97	3.00
3.00	5.00	77	5.00
5.00	20.00	121	12.00
20.00	28.00	99	22.00

Ground Level	36.29 mOD
Coordinates (m)	E 384216.61
National Grid	N 399049.72

Samples and Tests / Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.02 - 10.21		NI 85 200	CS 1			Extremely weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Distinctly to highly weathered with loss of strength and colour penetration at joints 2-3mm. Fractures are 0 to 5 degree, very closely to closely spaced, undulating, stepped with locally clayey sand infill. Assessed zone of core loss.	10.40 1no. joint 20 degree undulating smooth clean. Joint set is very widely spaced	10.50 +25.79 (0.80)		
10.50 - 12.00	48 4 0	- NA -				Recovered as reddish brown clayey SAND. (Completely weathered)		11.30 +24.99 (0.40)		
			40 80 100			Extremely weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Distinctly to highly weathered with loss of strength and colour penetration at joints 2-3mm. Fractures are 0 to 5 degree, very closely to closely spaced, undulating, stepped with locally clayey sand infill. Assessed zone of core loss.		11.70 +24.59 (0.30) 12.00 +24.29 (0.90)		
12.00 - 13.50	40 20 18	- NA -								
12.90			CS 20			Extremely weak thinly bedded reddish brown fine to coarse grained SANDSTONE. Distinctly to highly weathered with loss of strength and colour penetration at joints 2-3mm. Fractures are 0 to 5 degree, very closely to closely spaced, undulating, stepped with locally clayey sand infill. Assessed zone of core loss.	12.90-13.10 grey cobbles (possible cavings)	12.90 +23.39 (0.60) 13.50 +22.79 (0.65)		
		45 80 120								
13.50 - 13.58			SPTS 50 (25 for 45mm/50 for 30mm)	12.00						
13.50 - 15.00	57 21 19	- NA -				Extremely weak thinly bedded reddish brown fine grained SANDSTONE. Rare rounded fine gravel of quartz and igneous clasts.	14.15-16.50 highly fractured 14.37 1no. joint 80 to 85 degree undulating rough 14.40 1no. joint 20 degree undulating smooth clean. Joint set is very widely spaced	14.15 +22.14 (0.85) 15.00 +21.29 (0.80)		
14.37 - 14.59			CS 2							
14.66 - 14.82		65 80 175	CS 21							
						Assessed zone of core loss.				
15.00 - 16.50	47 0 0	- NA -				Reddish brown slightly gravelly SAND. Gravel is subrounded fine to coarse of quartz. (Completely weathered SANDSTONE)		15.80 +20.49 (0.70)		
16.50 - 16.59			SPTS 50 (25 for 50mm/50 for 40mm)	12.00						
16.50			CS 22			NO RECOVERY. Possible band of sand.		16.50 +19.79 (1.50)		
16.50 - 18.00	0 0 0	- NA -								
				11/10/19 12.00	1730 16.20					
				14/10/19 12.00	0800 10.60	Assessed zone of core loss.		18.00 +18.29 (0.70)		
18.00 - 19.50	52 0 0	- NI -				Reddish brown subrounded coarse GRAVEL of sandstone, quartz and mudstone.		18.70 +17.59 (0.16) 18.86 +17.43		
			Flush: 10.50 - 28.00 Water 0%	14/10/19 12.00	1600	Reddish brown fine SAND. Frequent fine to coarse rounded gravel lithorelicts of sandstone. (Completely weathered SANDSTONE)		(0.64)		
19.50 - 19.56			SPTS 50 (25 for 35mm/50 for 25mm)	15/10/19 12.00	0800 11.30	NO RECOVERY. Core barrel stuck in hole. Back hammering destroyed core.		19.50 +16.79		
19.50 - 20.00	0 0 0	- NI -								

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:44

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole BH01

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	10/10/2019
Logged	JH		
Checked	MS	**End**	17/10/2019
Approved	MS		

Equipment, Methods and Remarks

Comacchio Geo 205.
Dynamic sampling followed by rotary core drilling (PWF and HWF size) using water flush.
SPT Hammer ID: SC01, Rod type: NWY.

Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)
1.20	2.00	115	2.00
2.00	3.00	97	3.00
3.00	5.00	77	5.00
5.00	20.00	121	12.00
20.00	28.00	99	22.00

Ground Level	36.29 mOD
Coordinates (m)	E 384216.61
National Grid	N 399049.72

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
						NO RECOVERY. Core barrel stuck in hole. Back hammering destroyed core.				
20.00 - 22.00	0 0 0	- NA -						(2.50)		
						Extremely weak to very weak thinly cross bedded reddish brown fine to coarse grained SANDSTONE. Completely weathered at fractures into sand. Rock material fresh.	22.00-22.30 AZCL	22.00 +14.29		
22.37 - 22.50			CS 3							
22.00 - 23.50 22.77 - 22.84	82 38 15	20 50 130	CS 23				22.90 1no. joint 20 degree undulating smooth clean			
							23.30-24.15 85 degree subvertical joint 23.50-23.90 AZCL	(3.00)		
		-								
		NA	NI							
		-	NI							
			NI							
23.50 - 25.00	77 23 0	15 65 95								
			NI				24.80-24.95 90 degree planar smooth with clayey sand infill			
			NI							
			NI					25.00 +11.29		
						Extremely weak to very weak thinly cross bedded reddish brown fine to coarse grained SANDSTONE. Completely weathered at fractures into sand. Rock material fresh.				
25.33 - 25.44			CS 24							
25.00 - 26.50	100 77 56	NI 80 160					25.75 1no. joint 20 degree undulating smooth clean. Joint is closely/medium spaced			
26.24 - 26.31			CS 4							
26.40 - 26.51			CS 25					(3.00)		
							26.70-26.90 non intact			
26.50 - 28.00	95 28 7	NI 40 110								
							27.30-27.67 90 degree planar smooth with clayey sand infill			
27.55 - 27.62			CS 26				27.55-28.00 locally weak			
				15/10/19 22.00	1800		27.70-27.85 non intact			
27.94 - 28.00			CS 27							
27.94 - 28.00			CS 28			END OF EXPLORATORY HOLE		28.00 +8.29		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:44

Project	PROJECT NOMA PLOT P
Project No.	A9023-19
Carried out for	Buro Happold

Borehole

BH01

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	37.50 mOD
Logged	JH/RT	30/09/2019	Comacchio Geo 205.	1.20	2.00	101	2.00	**Coordinates (m)**	E 384254.05
Checked	MS	**End**	Dynamic sampling followed by rotary core drilling (PWF size) using water flush.	2.00	8.00	87	6.50	**National Grid**	N 399061.99
Approved	MS	04/10/2019	SPT Hammer ID: SC01, Rod type: NWY.	8.00	25.50	121	12.00		

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
			0.00-1.20 Hand excavated inspection pit.		
0.20	ES 1				
0.20 - 0.50	B 3				
0.50	ES 2				
0.50	D 4				
0.50 - 1.20	B 7				
1.00	ES 5				
1.00	D 6				
1.20 - 1.65	SPTC		N=25 (10,11/7,7,7,4)		
1.20 - 2.00	L		100% rec, diameter 101mm		
1.50	ES 8				
2.00 - 2.45	SPTC		N=21 (1,2/7,5,5,4)		
2.00	ES 9				
2.00 - 2.80	L		100% rec, diameter 87mm		
2.50	ES 10				
2.80 - 3.50	B 12				
2.80 - 3.20	L		100% rec, diameter 87mm	30/09/19 3.10	1700 Dry
3.20 - 4.50	L		23% rec, diameter 87mm	01/10/19 3.10	0800 1.10
4.50 - 4.77	SPTC		50 (10,4/28,22 for 45mm)	4.50	
4.50 - 6.00	L		15% rec, diameter 87mm		
6.00 - 6.08	SPTS		50 (25 for 60mm/50 for 25mm)	6.00	
6.00 - 7.50	L		15% rec, diameter 87mm		
7.50 - 8.00	D 11				
7.50 - 8.00	L		100% rec, diameter 87mm		
			N/A		
			NA		
			N/A		
	47	-			
8.00 - 9.00	13	NI			
	9	-			
		20			
9.33 - 9.42	84	80	CS 13		
	76	145			
9.00 - 10.50	41				

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend
MACADAM. (MADE GROUND)		(0.20) 0.20 +37.30	
Black slightly sandy subrounded to angular fine to coarse GRAVEL of macadam, concrete and brick. (MADE GROUND)		(0.10) 0.30 +37.20	
Greyish brown gravelly fine to coarse SAND with medium cobble content. Gravel is angular to subangular fine to coarse of brick, macadam, tile and slag. Cobbles (100x60mm) are tabular and angular of brick. (MADE GROUND)		(0.90) 1.20 +36.30	
Greyish brown and orangish brown very sandy subrounded to angular fine to coarse GRAVEL of brick and construction rubble with low cobble content. Sand is fine to coarse. Cobbles are angular and tabular of brick and concrete. (MADE GROUND)		(1.60) 2.80 +34.70	
CONCRETE basement slab reinforced with 20mm rebar. (MADE GROUND)		(0.70) 3.50 +34.00	
Zone of low recovery. Recovered material comprises of brown and grey subangular to subrounded COBBLES (120x80mm) of igneous and metamorphic origin. (Possible GLACIAL TILL)		(4.00) 7.50 +30.00	
Extremely weak reddish brown fine to medium grained SANDSTONE. Recovered as subrounded cobbles (80x70mm). (Distinctly weathered SANDSTONE)	8.00-8.30 AZCL	(1.10) 8.60 +28.90	
Extremely weak thinly bedded reddish brown fine to coarse, predominantly medium grained, SANDSTONE. Slightly weathered with some orange discolouration. Fractures are 2 degree, very closely to closely spaced, undulating, rough with clayey sand infill.	9.00-9.24 AZCL 9.93 stained orange band slightly weathered	(1.90)	

Backfill

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:45

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH02

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	37.50 mOD
Logged	JH/RT	30/09/2019	Comacchio Geo 205. Dynamic sampling followed by rotary core drilling (PWF size) using water flush. SPT Hammer ID: SC01, Rod type: NWY.	1.20	2.00	101	2.00	**Coordinates (m)**	E 384254.05
Checked	MS	**End**		2.00	8.00	87	6.50	**National Grid**	N 399061.99
Approved	MS	04/10/2019		8.00	25.50	121	12.00		

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.07 - 10.21			CS 5			Extremely weak thinly bedded reddish brown fine to coarse, predominantly medium grained, SANDSTONE. Slightly weathered with some orange discolouration. Fractures are 2 degree, very closely to closely spaced, undulating, rough with clayey sand infill.	10.50-10.80 AZCL	10.50 +27.00		
11.10 - 11.19	85		CS 14			Extremely weak to weak very thinly to thinly bedded reddish brown fine to coarse, predominantly medium, SANDSTONE. Slightly weathered with some black discolouration penetrating 1-2mm at discontinuities. Fractures are 2 degree, very closely to closely spaced, undulating, rough with clayey sand infill.				
10.50 - 12.00	85	45								
	48	100								
		180								
11.82 - 12.00			CS 6							
12.00 - 12.42			SPTC 50 (3,4/4,8,12,26 for 45mm)					(3.00)		
							12.12-12.32 interbedded with cross laminated brownish orange siltstone			
	100						12.65-13.90 becoming slightly gravelly. Gravel is rounded fine to medium of quartz			
12.00 - 13.50	90	40								
12.96 - 13.10	74	90	CS 15							
		140		01/10/19 6.50	1800 12.90					
				02/10/19 6.50	0800 8.10	Extremely weak thickly bedded reddish brown fine to coarse, predominantly coarse grained, SANDSTONE with frequent rounded fine to medium gravel of quartz and igneous clasts. Fractures are 0 to 5 degree, very closely to closely spaced undulating rough with clayey sand smearing.		13.50 +24.00		
	87	25					13.90-14.30 thin cross bedding	(0.80)		
13.50 - 15.00	87	45						14.30 +23.20		
	47	50				Weak very thinly cross bedded reddish brown fine to coarse, predominantly medium grained, SANDSTONE. Fractures are 0 to 2 degree, closely spaced, planar, rough.	14.40-15.00 gravel absent			
15.00 - 15.08			CS 16					(0.88)		
15.08 - 15.18		-	CS 17			Assessed zone of core loss. No recovery due to core barrel being stuck and back hammering.		15.18 +22.32		
		NA								
15.00 - 16.50	21	-						(1.02)		
	21									
	10									
			40					16.20 +21.30		
			80	02/10/19 12.00	1800 12.30	Weak reddish brown weak thickly bedded medium to coarse grained SANDSTONE with frequent rounded fine to coarse gravel of sandstone, mudstone and quartz. Fractures are 0 to 2 degree predominantly closely spaced, one medium, undulating, rough.		(0.30)		
			100	03/10/19 12.00	0800 12.50		16.50-16.90 AZCL	16.50 +21.00		
17.00 - 17.20		40	CS 18			Very weak to weak thinly bedded reddish brown coarse grained SANDSTONE with frequent rounded fine to medium gravel of sandstone, mudstone and quartz. Fractures are 0 to 2 degree, predominantly closely spaced, one medium, undulating.				
	73	120								
16.50 - 18.00	63	240								
	41						17.58-17.80 5 to 8 degree very closely to extremely closely spaced stepped rough joint set			
			19							
			7							
			9					(3.34)		
		40								
18.59 - 19.04	97	90	CS 19							
18.00 - 19.50	85	155								
	62									
		50								
		130								
		215								
19.95 - 20.22			CS 7			Extremely weak thinly laminated brownish red		19.84 (0.06) 19.90 (0.15) +17.66 +17.60		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:45

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH02

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	37.50 mOD
Logged	JH/RT	30/09/2019	Comacchio Geo 205.	1.20	2.00	101	2.00	**Coordinates (m)**	E 384254.05
Checked	MS	**End**	Dynamic sampling followed by rotary core drilling (PWF size) using water flush.	2.00	8.00	87	6.50	**National Grid**	N 399061.99
Approved	MS	04/10/2019	SPT Hammer ID: SC01, Rod type: NWY.	8.00	25.50	121	12.00		

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
20.05 - 20.13			CS 20			Extremely weak thinly laminated brownish red MUDSTONE. Fractures are 0 to 2 degree predominantly closely spaced, one medium, undulating, rough.		20.05 +17.45		
19.50 - 21.00	100 91 67	40 180 270		03/10/19 12.00	1800 13.20	Weak thinly bedded reddish brown CONGLOMERATE in a coarse grained sandstone matrix. Clasts are angular to subangular fine to coarse of quartz, mudstone, sandstone, quartzite and igneous material. Fractures are 0 to 2 degree predominantly closely spaced, one medium, undulating, rough.	20.32-23.80 35 to 40 degree medium spaced stepped smooth likely clean insitu			
21.13 - 21.31			CS 21	04/10/19 12.00	0800 13.40	Weak, locally very weak, thickly bedded reddish brown fine grained SANDSTONE with some (30x5mm) brown mudstone fragments and frequent siderite nodules. Fractures are 0 to 2 degree predominantly closely spaced, one medium, undulating, rough joint set (probably sand infill lost).				
21.00 - 22.50	95 95 77	50 145 290					22.35 35 to 40 degree medium spaced stepped smooth clean 22.80 green reduction spots	(5.45)		
23.06 - 23.12	100		CS 22							
22.50 - 24.00	97 81									
23.62 - 23.82		60 150 200	CS 8				23.60 green reduction spots			
24.00 - 25.50	82 82 76	80 110 310								
24.91 - 25.00		100 120 140	CS 23	04/10/19 12.00	1800 13.40		24.92-24.98 recovered as dense red fine sand 25.20-25.50 extremely weak thinly laminated			
						END OF EXPLORATORY HOLE	brownish red mudstone. Recovered as tabular coarse gravel of mudstone	25.50 +12.00		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:45

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH02

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	
Logged	RT/JH	07/10/2019	
Checked	MS	**End**	
Approved	MS	08/10/2019	

Equipment, Methods and Remarks

Comacchio Geo 205.
Dynamic sampling followed by rotary core drilling (PWF size) using water flush.
SPT Hammer ID: SC01, Rod type: NWY.

Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)
1.20	1.50	115	1.50
1.50	4.00	95	1.50
4.00	5.00	88	1.50
5.00	6.00	95	5.00
6.00	7.50	121	6.00

Ground Level	37.21 mOD
Coordinates (m)	E 384223.37
National Grid	N 399024.19

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.15 ES 1 0.25 ES 2 0.25 - 0.50 B 3 0.50 B 4			0.00-1.20 Hand excavated inspection pit.			Dark grey MACADAM. (MADE GROUND)		0.10 (0.10) +37.11		
						Dark grey sandy subangular fine to coarse GRAVEL of roadstone, concrete and macadam. (MADE GROUND)		0.20 (0.10) +37.01		
						Brown fine to coarse SAND AND angular to subangular fine to coarse GRAVEL of brick, concrete and limestone. Occasional fragments (<100x50x70mm) of brick. (MADE GROUND)	0.50 steel obstruction, pit extended	(1.00)		
1.00 ES 5 1.00 D 6				07/10/19	1800 Dry					
1.20 - 1.65 SPTS 1.20 - 1.50 L			N=8 (1,2/2,1,2,3) 100% rec, diameter 110mm	08/10/19	0800 Dry	Firm dark greyish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of sandstone, concrete and brick. (MADE GROUND)		1.20 +36.01		
1.50 ES 7 1.50 D 8 1.50 - 2.50 L			85% rec, diameter 95mm					(0.80)		
2.00 - 2.45 B 9						Grey CONCRETE slab. (MADE GROUND)		2.00 +35.21		
								(0.45)		
2.50 - 2.95 SPTS 2.50 D 10 2.50 - 4.00 L			N=20 (2,10/2,15,2,1) 37% rec, diameter 95mm	1.50	Dry	1no. angular cobble of brick recovered. (MADE GROUND)		2.45 +34.76		
								(1.00)		
3.60 ES 11						Light brown slightly gravelly sandy CLAY. Gravel is subrounded to rounded medium to coarse of various sedimentary rock. (MADE GROUND)		3.45 +33.76		
								(0.55)		
4.00 - 4.45 SPTS 4.00 - 5.00 L			N=35 (2,3/5,5,20,5) 100% rec, diameter 88mm	1.50	Dry	Dense dark brown, mottled black, slightly gravelly medium to coarse SAND with low cobble content. Gravel is rounded fine of brick and concrete. Cobbles are angular of brick and concrete. Slight hydrocarbon odour. (MADE GROUND)		4.00 +33.21		
								(0.50)		
4.50 ES 12 4.50 D 13								4.50 +32.71		
5.00 - 5.45 SPTS 5.00 D 14 5.00 - 6.00 L			5.00-6.00 Open hole drilling. N=28 (3,6/6,7,7,8) 0% rec, diameter 95mm	1.50	Dry	Medium dense dark brown, mottled orange and black, sandy clayey rounded fine to coarse, predominantly coarse, GRAVEL of various sedimentary rock. Sand is medium to coarse. (Possible MADE GROUND)		(1.30)		
								5.80 +31.41		
						Reddish brown fine to coarse SAND. (Completely weathered SANDSTONE)		(0.20)		
6.00 - 6.14	- NI -		50 (25 for 65mm/40,10 for 5mm)	1.50	Dry	Extremely weak reddish brown medium to coarse grained SANDSTONE. Recovered as dense slightly gravelly sand. Gravel is subrounded coarse.		6.00 +31.21		
								(0.40)		
6.50 - 6.59			CS 15					6.40 +30.81		
6.00 - 7.50	100 47 30	60 80 150				Extremely weak reddish brown medium to coarse grained SANDSTONE. Partially weathered with colour penetration of lighter brown 1mm on joint surfaces. Fractures are 0 to 5 degree very closely spaced, undulating and rough.		(1.10)		
			NI NI NI	08/10/19 6.00	1700 Dry					
						END OF EXPLORATORY HOLE		7.50 +29.71		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:46

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH03

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	DSUK	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	35.99 mOD
Logged	JH	09/10/2019	Comacchio Geo 205.	1.20	6.00	77	6.00	**Coordinates (m)**	E 384247.11
Checked	MS	**End**	Dynamic sampling followed by rotary core drilling (PWF size) using water flush.	6.00	7.50	121	6.00	**National Grid**	N 399098.70
Approved	MS	10/10/2019	SPT Hammer ID: SC01, Rod type: NWY.						

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			0.00-0.70 Hand excavated inspection pit.			Black sandy subangular fine to coarse GRAVEL of macadam. (MADE GROUND)		0.05 (0.05) +35.94		
0.20	ES 1									
0.20	D 2							(0.50)		
0.20 - 0.55	B 5					Reddish grey and brown very gravelly fine to coarse SAND. Gravel is angular fine to coarse of predominantly brick and mortar. (MADE GROUND)		0.55 +35.44		
0.50	ES 3									
0.50	D 4							(0.63)		
			0.70-1.20 Open hole drilling.			CONCRETE slab. (MADE GROUND)		1.18 (0.07) +34.81		
1.20 - 1.65	SPTS		N=20 (4,4/5,5,5,5)	1.20	Dry	Dark brown slightly sandy rounded fine to coarse GRAVEL of various lithologies.		1.25 +34.74		
1.20 - 2.00	L		100% rec, diameter 77mm							
1.30	ES 6					Medium dense brown slightly gravelly silty coarse SAND. Gravel is rounded medium to coarse of various lithologies. Rare organic lenses (<60mm).				
1.50	D 7							(1.15)		
1.50 - 2.00	B 8									
2.00 - 2.45	SPTS		N=30 (4,5/5,6,9,10)	1.20	Dry					
2.00 - 3.00	L		80% rec, diameter 77mm							
						Stiff dark brown slightly gravelly sandy CLAY. Sand is predominantly medium. Gravel is rounded fine to coarse of various lithologies.		2.40 +33.59		
2.50	D 9							(0.25)		
2.70 - 3.00	B 10							2.65 +33.34		
						Reddish brown slightly gravelly coarse SAND. Gravel is rounded fine to coarse of various lithologies.		(0.35)		
3.00 - 3.16	SPTS		50 (25 for 65mm/38,12 for 15mm)	4.00	Dry			3.00 +32.99		
3.00 - 4.00	L		0% rec, diameter 77mm			Zone of low recovery. Recovered material comprises grey and brown subangular to subrounded COBBLES (100x80x60mm) of various lithologies. (Possible GLACIAL TILL)				
4.00 - 4.24	SPTS		50 (25 for 40mm/16,16,18 for 45mm)	4.00	Dry					
4.00 - 6.00	B 11									
4.00 - 4.50	L		10% rec, diameter 77mm							
4.50 - 6.00	L		33% rec, diameter 77mm					(3.00)		
				09/10/19	1730					
				4.50	Dry					
6.00 - 6.22		NI	50 (7,18/50 for 65mm)	10/10/19	0800	Greenish grey rounded coarse GRAVEL of igneous lithologies. (Possible GLACIAL TILL)	6.00-6.38 AZCL	6.00 +29.99		
		NI		4.50	2.45					
		NI						(0.39)		
						Extremely weak cross laminated reddish brown medium to fine grained SANDSTONE. Slightly weathered with lightening colour penetration at joint 1mm. Fractures are 0 to 5 degree, very closely to closely spaced, planar, rough.		6.39 +29.60		
	75									
6.00 - 7.50	58							(1.11)		
	58	NI								
		80								
		160								
				10/10/19	1200					
				6.00						
							7.41 1no 2 degree planar stepped. Some evidence of clay infill preserved in stepped joint			
						END OF EXPLORATORY HOLE		7.50 +28.49		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 7.50	No groundwater encountered during drilling.

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:50

20/02/2020 12:52:46

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Borehole

BH04

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged RT **Checked** MS **Approved** MS	**Start** 09/10/2019 **End** 09/10/2019	**Equipment, Methods and Remarks** Hand excavated to 0.80m.	**Dimension and Orientation** Width 0.40 m Length 1.55 m A / D / B / C 0 (Deg)	**Ground Level** **Coordinates (m)** **National Grid**

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			Paving SLABS. (MADE GROUND)		(0.10) 0.10		
0.20 0.20 - 0.40	ES1 B2		Dark brown fine to coarse SAND AND subangular to subrounded fine to coarse GRAVEL of brick, concrete, macadam and sandstone. (MADE GROUND)		(0.30)		
0.40 - 0.80	B4		Reddish brown slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of poorly cemented sandstone.		0.40		
0.60	ES3	09/10/19 damp			(0.40)		
			END OF EXPLORATORY HOLE		0.80		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1		Damp throughout.

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather Indoors

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:55:29

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

Carried out for **Buro Happold**

Trial Pit

HTP03

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged RT **Checked** MS **Approved** MS	**Start** 09/10/2019 **End** 09/10/2019	**Equipment, Methods and Remarks** Hand excavated to 1.10m.	**Dimension and Orientation** Width 0.40 m Length 1.55 m A / D / B / C 0 (Deg)	**Ground Level** **Coordinates (m)** **National Grid**

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			Paving SLABS. (MADE GROUND)		(0.10) 0.10		
0.20	ES1		Dark brown fine to coarse SAND AND subangular to subrounded fine to coarse GRAVEL of brick, flint and concrete. (MADE GROUND)		(0.20) 0.30		
0.20 - 0.30	B2						
0.30 - 0.50	B4						
0.40	ES3		Yellowish brown fine to coarse SAND AND subangular to subrounded fine to coarse GRAVEL of brick, sandstone and flint with low cobble content. Cobbles are subangular of brick. (MADE GROUND)		(0.20) 0.50		
0.50 - 0.80	B5						
			Reddish brown and dark grey slightly gravelly fine to coarse SAND. Gravel is subangular to well rounded of various lithologies.				
0.70	ES6						
		09/10/19 damp			(0.60)		
			END OF EXPLORATORY HOLE		1.10		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1		Damp throughout.

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather Indoors

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:55:29

AGS

Project: **PROJECT NOMA PLOT P**

Project No.: **A9023-19**

Carried out for: **Buro Happold**

Trial Pit

HTP04

Trial Pit Log

SOCOTEC

Logged JH	**Start** 04/10/2019	**Equipment, Methods and Remarks**	**Dimension and Orientation**	**Ground Level**	37.28 mOD
Checked MS	**End** 04/10/2019	JCB 3CX. Machine excavated.	Width 1.00 m Length 2.30 m A / D / B / C 270 (Deg)	**Coordinates (m)**	E 384213.66
Approved MS				**National Grid**	N 399014.14

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Dark grey and black MACADAM. (MADE GROUND)		0.05 (0.05) +37.23		
0.20 - 0.50	B4		Dark grey and black sandy subangular fine to coarse GRAVEL of roadstone. Sand is fine to coarse. (MADE GROUND)		0.15 (0.10) +37.13		
0.30	ES2						
0.30	D3		Brown sandy angular to subrounded fine to coarse GRAVEL of brick, flint, concrete, broken wall tile and chalk with rare strips of aluminium door runner or window strips. Sand is fine to coarse. Frequent full and half brick cobbles. (MADE GROUND)		(0.75)		
0.90	D5		CONCRETE slab. (MADE GROUND)		0.90 (0.05) +36.38 0.95 +36.33		
			Brown sandy angular to subrounded fine to coarse GRAVEL of brick, flint, concrete, broken wall tile and chalk. Sand is fine to coarse. (MADE GROUND)		(0.60)		
1.55 - 1.80	B8		Brownish orange gravelly fine to medium SAND with low cobble content. Gravel is rounded fine to coarse of igneous lithologies. Cobbles are rounded of igneous lithologies.		1.55 +35.73		
1.60	ES6						
1.60	D7				(0.75)		
		04/10/19	Dark brown sandy rounded fine to coarse GRAVEL of igneous lithologies with medium cobble content. Sand is fine to coarse. Cobbles are rounded of igneous lithologies.		2.30 +34.98 (0.25)		
			END OF EXPLORATORY HOLE		2.55 +34.73		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	2.55	Seepage. Slow inflow.

Remarks

Depth (m)	Remarks
1.35	Southern Face is 1.35m to bottom of foundation.

Stability Stable

Shoring None

Weather Raining

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:56:47

AGS

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

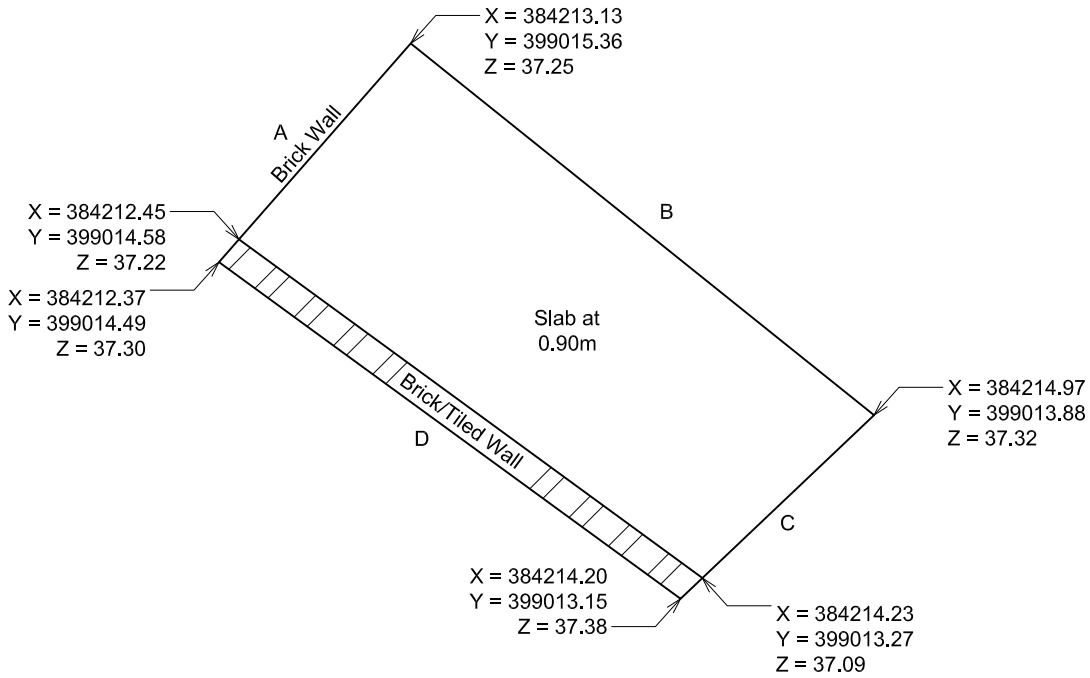
Carried out for **Buro Happold**

Trial Pit

MTP01

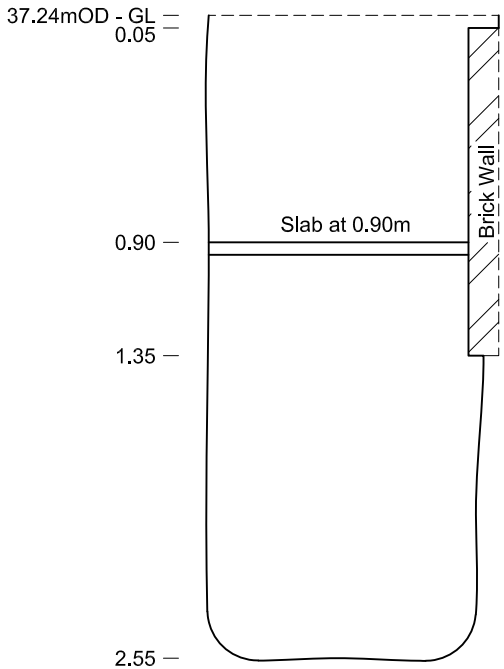
Sheet 1 of 1

Trial Pit Drawing

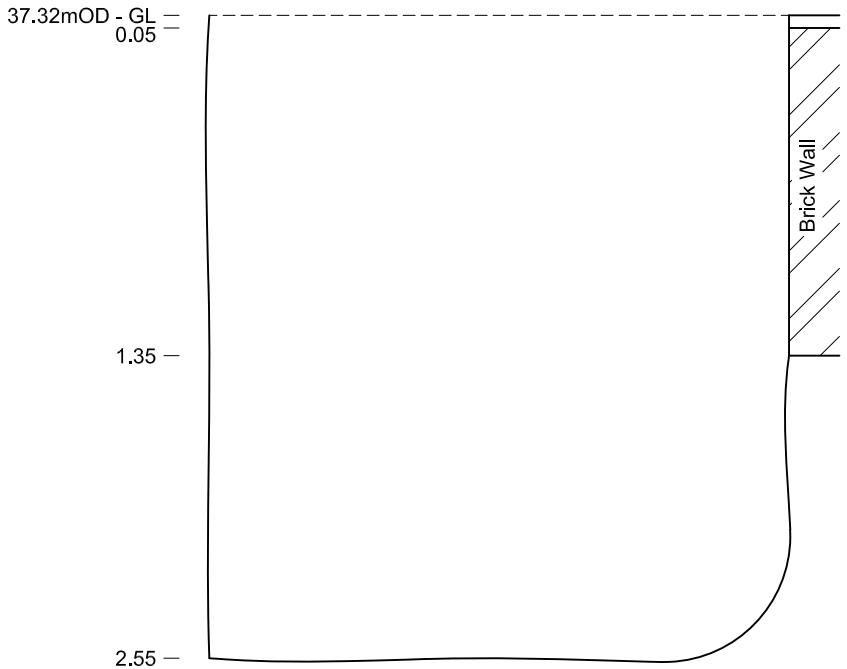


All dimensions in metres. Scale: 1:30 A4	Project	Project NOMA Plot P Ground Investigation	TP No.
	Project no.	A9023-19	MTP01
	Client	Gardiner & Theobald LLP	

Trial Pit Drawing



SECTION B-D



SECTION C-A

All dimensions in metres. Scale: 1:30 A4	Project	Project NOMA Plot P Ground Investigation	TP No.
	Project no.	A9023-19	MTP01
	Client	Gardiner & Theobald LLP	

Trial Pit Log

SOCOTEC

Logged JH **Checked** MS **Approved** MS	**Start** 04/10/2019 **End** 04/10/2019	**Equipment, Methods and Remarks** JCB 3CX. Machine excavated.	**Dimension and Orientation** Width 1.00 m Length 2.30 m A / D / B / C 20 (Deg)	**Ground Level** 37.86 mOD **Coordinates (m)** E 384233.98 **National Grid** N 399013.94	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Dark grey and black MACADAM. (MADE GROUND)		(0.10) 0.10 +37.76		
0.20 - 0.60	B4		Black sandy angular to subrounded fine to coarse GRAVEL of macadam and concrete. Sand is fine to coarse. (MADE GROUND)		(0.20) 0.30 +37.56		
0.30	ES2		Brown and grey sandy angular to subangular fine to coarse GRAVEL of brick with low cobble content. Cobbles are angular of brick. (MADE GROUND)		(0.40) 0.70 +37.16		
0.50	D3		Orangish brown fine SAND.				
0.90	ES5						
1.00	D6				(0.70)		
		04/10/19 Dry					
			END OF EXPLORATORY HOLE		1.40 +36.46		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
1.40	Pit terminated due to service.

Stability Stable

Shoring None

Weather Raining

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:58:03

Project **PROJECT NOMA PLOT P**

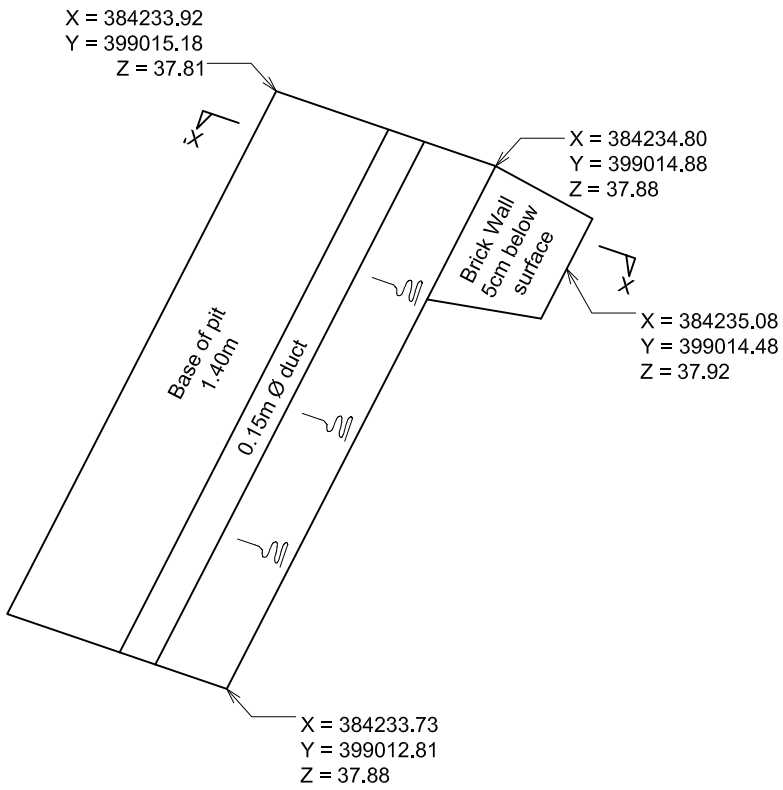
Project No. **A9023-19**

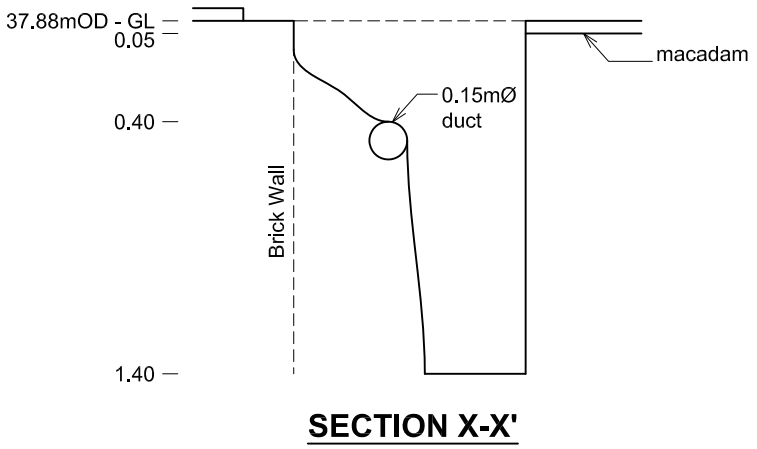
Carried out for **Buro Happold**

Trial Pit

MTP02

Trial Pit Drawing





SECTION X-X'

All dimensions in metres. Scale: 1:30 A4	Project	Project NOMA Plot P Ground Investigation	TP No.
	Project no.	A9023-19	MTP02
	Client	Gardiner & Theobald LLP	

Trial Pit Log

SOCOTEC

Logged JH	**Start** 03/10/2019	**Equipment, Methods and Remarks**	**Dimension and Orientation**	**Ground Level**	37.72 mOD
Checked MS	**End** 03/10/2019	JCB 3CX. Machine excavated.	Width 1.10 m Length 2.50 m A / B / C / D, 200 (Deg)	**Coordinates (m)**	E 384253.29
Approved MS				**National Grid**	N 399051.59

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Dark grey MACADAM. (MADE GROUND)		(0.10) 0.10 +37.62		
0.20 - 0.50	B4	03/10/19 Dry	Black sandy angular to subrounded fine to coarse GRAVEL of concrete, macadam and brick. (MADE GROUND)		(0.10) 0.20 +37.52		
			Greyish brown gravelly fine to coarse SAND with medium cobble and boulder content. Gravel is angular to subangular fine to coarse of brick and concrete. Cobbles and boulders (250x120x100mm) are subangular to subrounded of concrete and brick. (MADE GROUND)		(0.30)		
0.50 0.50	ES2 D3		END OF EXPLORATORY HOLE		0.50 +37.22		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 0.50	No groundwater encountered during excavation.
0.50	Pit terminated due to 130mm diameter black service piping, 35mm from western face, orientated 020 degree.

Stability Stable

Shoring None

Weather Dry, overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:58:35

AGS

Project **PROJECT NOMA PLOT P**

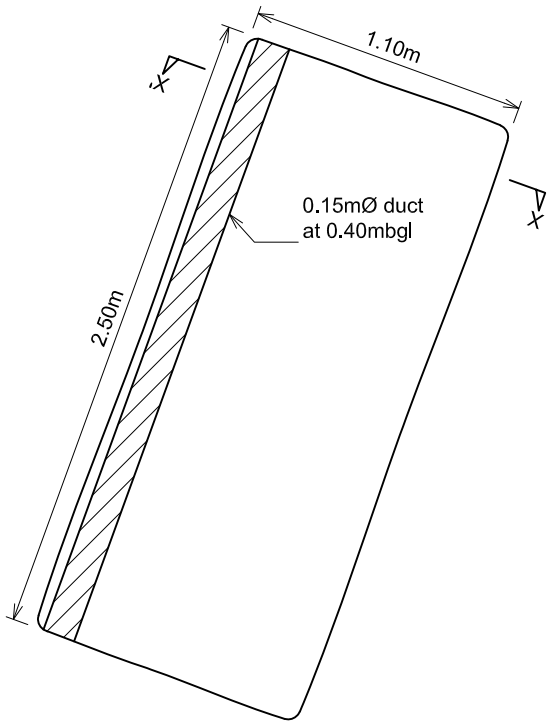
Project No. **A9023-19**

Carried out for **Buro Happold**

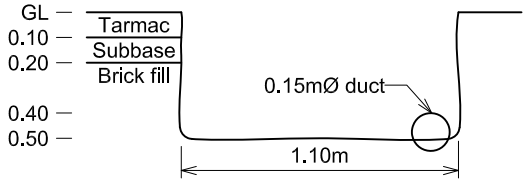
Trial Pit

MTP03

Trial Pit Drawing



PLAN VIEW



SECTION X-X'

All dimensions in metres. Scale: 1:30 A4	Project	Project NOMA Plot P Ground Investigation	TP No.
	Project no.	A9023-19	MTP03
	Client	Gardiner & Theobald LLP	

Trial Pit Log

SOCOTEC

Logged JH	**Start** 03/10/2019	**Equipment, Methods and Remarks** JCB 3CX. Machine excavated.	**Dimension and Orientation** Width 0.80 m, Length 2.10 m, 120 (Deg)	**Ground Level**	36.20 mOD
Checked MS	**End** 03/10/2019			**Coordinates (m)**	E 384203.81
Approved MS				**National Grid**	N 399053.22

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			TOPSOIL.		0.05 (0.05) +36.15		
			Reddish brown fine SAND. (MADE GROUND)		0.15 (0.10) +36.05		
0.20 0.20 - 0.50	ES1 B4		Greyish brown and red slightly gravelly sandy COBBLES. Gravel is predominantly angular fine to coarse of brick and concrete. Cobbles are subangular of brick, including full bricks and half brick fragments. Cobbles are angular of brick and concrete. Occasional angular and subangular boulders of concrete. (MADE GROUND)				
0.50 0.50	ES2 D3				(1.55)		
1.70 - 1.90	B7	03/10/19 Dry	Orangish brown, mottled grey, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of metamorphic and igneous lithologies. (GLACIAL TILL)		1.70 +34.50		
1.90 1.90	ES5 D6				(0.30)		
			END OF EXPLORATORY HOLE		2.00 +34.20		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 2.00	No groundwater encountered during excavation. Ground unsuitable for hand vanes.

Stability Spalling.

Shoring None

Weather Dry, cloudy

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:58:58

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

Carried out for **Buro Happold**

Trial Pit

MTP04

Trial Pit Log

SOCOTEC

Logged RT **Checked** MS **Approved** MS	**Start** 07/10/2019 **End** 07/10/2019	**Equipment, Methods and Remarks** JCB 3CX. Machine excavated.	**Dimension and Orientation** Width 2.10 m Length 0.90 m A / D / B / C 135 (Deg)	**Ground Level** 35.84 mOD **Coordinates (m)** E 384217.70 **National Grid** N 399072.13	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES1 D2		Brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick and concrete. Frequent pockets (<60mm) of reddish brown fine to coarse sand. Frequent cobbles of whole and half brick. (MADE GROUND)				
0.50 0.50 0.50	ES4 D5 B3						
					(1.85)		
1.00 1.00 1.00 - 1.50	ES6 D7 B8						
1.50 1.50	ES9 D10	07/10/19					
			CONCRETE floor slab. (MADE GROUND)		1.85 (0.00) +33.99	1	
			END OF EXPLORATORY HOLE				

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.85	Seepage.

Remarks

Depth (m)	Remarks

Stability Unstable.

Shoring None

Weather Raining

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:59:22

AGS

Project **PROJECT NOMA PLOT P**

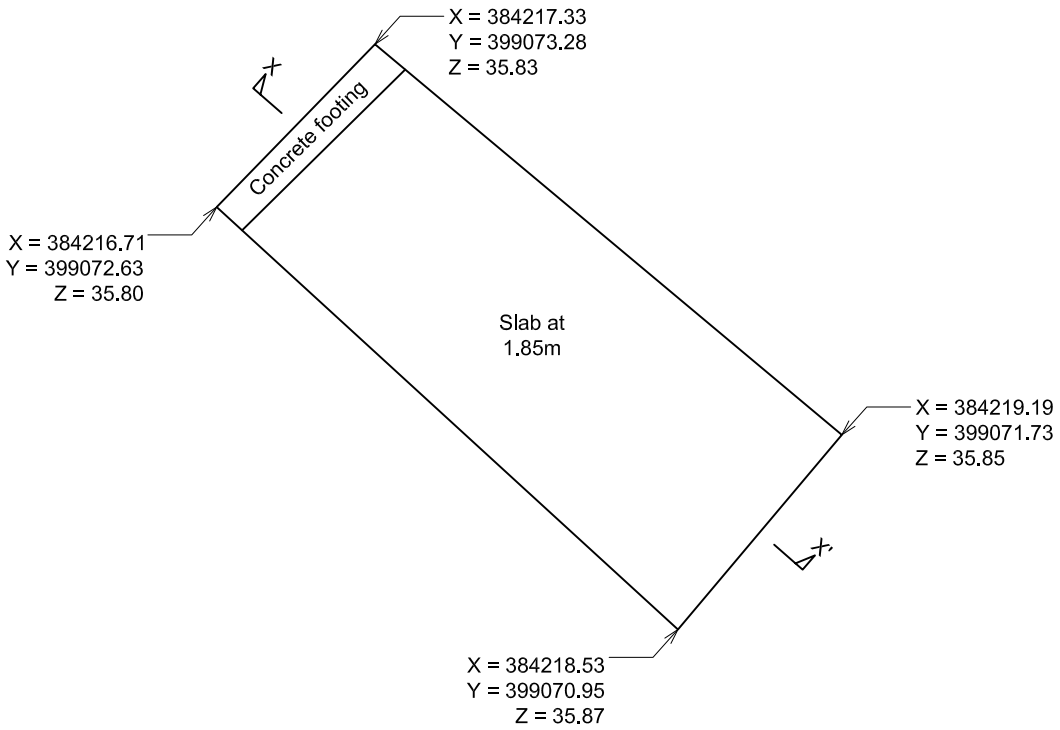
Project No. **A9023-19**

Carried out for **Buro Happold**

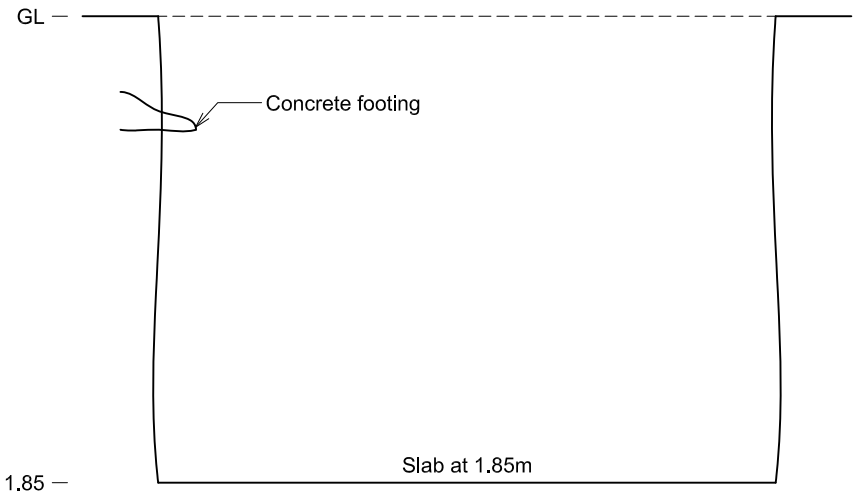
Trial Pit

MTP05

Trial Pit Drawing



PLAN VIEW



SECTION X-X'

All dimensions in metres.	Project	Project NOMA Plot P Ground Investigation	TP No.
Scale: 1:30 A4	Project no.	A9023-19	MTP05
	Client	Gardiner & Theobald LLP	

Trial Pit Log

SOCOTEC

Logged JH	**Start** 08/10/2019	**Equipment, Methods and Remarks**	**Dimension and Orientation**	**Ground Level**	36.08 mOD
Checked MS		Hand excavated to 1.00m.	Width 0.50 m	**Coordinates (m)**	E 384238.36
Approved MS	**End** 08/10/2019		Length 1.30 m	**National Grid**	N 399084.41

A / D / B / C — 60 (Deg)

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			Black sandy angular fine to coarse GRAVEL of macadam. (MADE GROUND)		(0.20)		
0.20	ES1				0.20 +35.88		
0.20	D2		Light grey slightly sandy angular to subangular fine to coarse GRAVEL of limestone. (MADE GROUND)				
0.20 - 0.40	B3				(0.30)		
0.40	ES4						
			Orangish brown silty fine to medium, predominantly fine, SAND. Rare rounded cobbles and rounded coarse gravel of sandstone.		0.50 +35.58		
0.60 - 1.00	B7						
					(0.50)		
0.80	ES5	08/10/19 Dry					
0.80	D6						
			END OF EXPLORATORY HOLE		1.00 +35.08		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks

Stability Stable

Shoring None

Weather Dry, cloudy

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 12:59:45

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

Carried out for **Buro Happold**

Trial Pit

MTP06

Trial Pit Log

SOCOTEC

Logged RT **Checked** MS **Approved** MS	**Start** 07/10/2019 **End** 07/10/2019	**Equipment, Methods and Remarks** JCB 3CX. Machine excavated.	**Dimension and Orientation** Width 1.00 m Length 2.20 m A / D / B / C 35 (Deg)	**Ground Level** 35.58 mOD **Coordinates (m)** E 384248.64 **National Grid** N 399112.55	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			Dark grey subangular to subrounded fine to coarse GRAVEL of roadstone. (MADE GROUND)		(0.30)		
0.20 0.25 0.30 - 0.70	ES1 D2 B3				0.30 +35.28		
0.50	ES4		Brown sandy slightly clayey subangular to rounded fine to coarse GRAVEL of flint, quartzite, brick and concrete with low cobble content. Sand is fine to coarse. Cobbles (150x100x100mm) are subangular of brick and concrete. Rare boulders (400x 250x100mm). Occasional fragments of plastic sheeting. (MADE GROUND)		(0.80)		
1.15 1.20 - 1.60 1.30	D5 B7 ES6		Firm to stiff reddish brown sandy CLAY with rare rounded fine to coarse gravel of various lithologies. (GLACIAL TILL)		1.10 +34.48		
1.50	HV	p 71kPa, r 26kPa 07/10/19			(0.70)		
1.80	D8		END OF EXPLORATORY HOLE	1.70-1.80 becoming gravelly. Gravel is subrounded to rounded predominantly medium to coarse of various lithologies	1.80 +33.78	1	

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.80	Slow inflow

Remarks

Depth (m)	Remarks

Stability Spalling at 1.10m.

Shoring None

Weather Raining

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 13:00:03

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

Carried out for **Buro Happold**

Trial Pit

MTP07

Trial Pit Log

SOCOTEC

Logged JH	**Start** 08/10/2019	**Equipment, Methods and Remarks** JCB 3CX. Machine excvated.	**Dimension and Orientation** Width 0.80 m, Length 2.30 m, A/B/C/D, 60 (Deg)	**Ground Level**	39.36 mOD
Checked MS	**End** 08/10/2019			**Coordinates (m)**	E 384272.22
Approved MS				**National Grid**	N 399055.02

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			MACADAM. (MADE GROUND)		0.05 (0.05) +39.31		
0.20 0.20	ES1 D2		Light grey sandy angular to subangular fine to coarse GRAVEL of limestone. Sand is fine to coarse. (MADE GROUND)		(0.40)		
0.50 0.50 0.50 - 1.00	ES3 D4 B5		Brown grey gravelly clayey fine to coarse SAND with low cobble and boulder content. Gravel is angular to subangular fine to coarse of brick, concrete, stone flags and possible asbestos pipe. (MADE GROUND)		0.45 +38.91		
1.00	ES6				(1.55)		
1.50	ES7						
2.00 - 3.00 2.10	B10 ES8		Light brown to dark brown gravelly fine to coarse SAND with low cobble content. Gravel is rounded fine to coarse of various lithologies. Cobbles are rounded of sandstone. (GLACIAL TILL)		2.00 +37.36		
2.50	D9				(1.10)		
		08/10/19 Dry					
			END OF EXPLORATORY HOLE		3.10 +36.26		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 3.10	No groundwater encountered during excavation.
3.10	Trial pit terminated due to spalling of made ground.

Stability Spalling in natural

Shoring None

Weather Heavy rain.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25

20/02/2020 13:00:38

AGS

Project **PROJECT NOMA PLOT P**

Project No. **A9023-19**

Carried out for **Buro Happold**

Trial Pit

MTP08

Core Log

SOCOTEC

Drilled by	DD	**Date Cored**	**Equipment, Methods and Remarks**	**Depth (mm) from**	**To**	**Diameter (mm)**	**Ground Level**
Logged by	RT	09/10/2019	Concrete coring horizontal through basement wall.	0	1500	107	**Coordinates (m)**
Checked by	MS						**National Grid**
Approved by	MS						

Description of Materials	Detail	Legend	Depth (mm)	Thickness (mm)	Remarks
Reddish brown BRICK with dark brown sand/cement mortar joint (10mm thick). (MADE GROUND)				220	
			220		
Cavity wall void.				50	
			270		
Reddish brown BRICK with dark brown sand/cement mortar joint (10mm thick). (MADE GROUND)				230	
			500		
Grey CONCRETE. Aggregate is fine to coarse gravel (approximately 70%) fine to coarse sand. <10% voids in matrix. Voids generally <6mm. (MADE GROUND)				1000	
			1500		
END OF CORE					

Remarks

Core carried out within HTP03.

Core Location

Notes:

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Scale 1:10

20/02/2020 12:54:16

Project	**PROJECT NOMA PLOT P**
Project No.	**A9023-19**
Carried out for	**Buro Happold**

Borehole

CC03

Core Log

SOCOTEC

Drilled by	DD	**Date Cored**	**Equipment, Methods and Remarks**	**Depth (mm) from**	**To**	**Diameter (mm)**	**Ground Level**
Logged by	RT	09/10/2019	Concrete coring horizontal through basement wall.	0	500	107	**Coordinates (m)**
Checked by	MS						**National Grid**
Approved by	MS						

Description of Materials	Detail	Legend	Depth (mm)	Thickness (mm)	Remarks
Reddish brown BRICK with dark brown sand and cement mortar joint (10mm). (MADE GROUND)				230	
			230		
Cavity wall void.				50	
			280		
Reddish brown BRICK with dark brown sand and cement mortar joint (10mm). (MADE GROUND)				220	
END OF CORE	0.50 subsoil		500		

Remarks

Core carried out within HTP04.

Core Location

Notes:

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Scale 1:10

20/02/2020 12:54:16

Project	**PROJECT NOMA PLOT P**
Project No.	**A9023-19**
Carried out for	**Buro Happold**

Borehole

CC04

Sheet 1 of 1

APPENDIX C
INSTRUMENTATION AND MONITORING

Monitoring Installation Details	Table C1
Groundwater Monitoring	Table C2
Gas Monitoring	Table C3

Groundwater Monitoring Installations Summary

Instrument Reference	Instrument Type (See Notes)	Installation Date, dd/mm/yyyy	Pipe Diameter, mm	Instrument Base, mbgl	Response Zone Range, mbgl	Pipe Top Details	Headworks	Remarks
BH01 (D)	SPIE	17/10/2019	19	15.00	14.50 to 15.50	Open	Flush cover	
BH01 (S)	SP	07/10/2019	50	4.00	1.70 to 4.00	Open	Flush cover	
BH02 (D)	SPIE	04/10/2019	19	20.00	15.00 to 20.50	Gas tap	Flush cover	
BH02 (S)	SP	04/10/2019	50	7.00	4.00 to 7.00	Gas tap	Flush cover	
BH03 (1)	SP	09/10/2019	50	6.00	3.00 to 6.00	Gas tap	Flush cover	
BH04 (1)	SP	10/10/2019	50	3.00	1.50 to 3.00	Gas tap	Flush cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Groundwater Monitoring

SOCOTEC

Instrument Reference	Instrument Type	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Groundwater depth, mbgl	Comments
BH01 (D)	SPIE	15.00	22/11/2019 11:02:00	10.51	
BH01 (D)	SPIE	15.00	06/12/2019 09:55:00	10.44	
BH01 (D)	SPIE	15.00	20/12/2019 10:20:00	10.35	
BH01 (D)	SPIE	15.00	06/01/2020 11:46:00	10.43	
BH01 (S)	SP	4.00	25/10/2019 11:00:00	Dry	
BH01 (S)	SP	4.00	07/11/2019 09:00:00	Dry	
BH01 (S)	SP	4.00	22/11/2019 10:58:00	Dry	
BH01 (S)	SP	4.00	06/12/2019 09:45:00	Dry	
BH01 (S)	SP	4.00	20/12/2019 10:05:00	Dry	
BH01 (S)	SP	4.00	20/12/2019 10:15:00	Dry	
BH01 (S)	SP	4.00	06/01/2020 11:45:00	Dry	
BH02 (D)	SPIE	20.00	09/10/2019 14:32:00	10.42	Silty
BH02 (D)	SPIE	20.00	10/10/2019 08:06:00	10.47	Silty
BH02 (D)	SPIE	20.00	11/10/2019 14:06:00	10.60	Silty
BH02 (D)	SPIE	20.00	14/10/2019 09:46:00	10.70	Silty
BH02 (D)	SPIE	20.00	15/10/2019 08:36:00	10.86	Silty
BH02 (D)	SPIE	20.00	25/10/2019 11:20:00	10.95	
BH02 (D)	SPIE	20.00	07/11/2019 10:10:00	11.04	
BH02 (D)	SPIE	20.00	22/11/2019 11:42:00	11.10	
BH02 (D)	SPIE	20.00	06/12/2019 10:10:00	11.13	
BH02 (D)	SPIE	20.00	20/12/2019 09:55:00	11.09	
BH02 (D)	SPIE	20.00	06/01/2020 12:22:00	11.18	
BH02 (S)	SP	7.00	09/10/2019 14:30:00	6.40	
BH02 (S)	SP	7.00	10/10/2019 08:05:00	6.42	
BH02 (S)	SP	7.00	11/10/2019 14:05:00	6.43	Silty
BH02 (S)	SP	7.00	14/10/2019 09:45:00	Dry	Silty
BH02 (S)	SP	7.00	15/10/2019 08:35:00	Dry	Silty
BH02 (S)	SP	7.00	22/11/2019 11:44:00	Dry	
BH02 (S)	SP	7.00	06/12/2019 10:00:00	Dry	
BH02 (S)	SP	7.00	20/12/2019 09:45:00	Dry	
BH02 (S)	SP	7.00	20/12/2019 09:50:00	Dry	
BH02 (S)	SP	7.00	06/01/2020 12:20:00	Dry	
BH03 (1)	SP	6.00	10/10/2019 08:10:00	6.05	Checked depth 6.15m
BH03 (1)	SP	6.00	11/10/2019 14:10:00	6.10	Checked depth 6.14m, silty
BH03 (1)	SP	6.00	14/10/2019 09:50:00	Dry	Silty
BH03 (1)	SP	6.00	15/10/2019 08:40:00	6.10	Checked depth 6.10m, silty
BH03 (1)	SP	6.00	25/10/2019 11:40:00	6.05	
BH03 (1)	SP	6.00	07/11/2019 09:20:00	6.18	
BH03 (1)	SP	6.00	22/11/2019 12:06:00	Dry	
BH03 (1)	SP	6.00	06/12/2019 10:25:00	Dry	
BH03 (1)	SP	6.00	20/12/2019 09:30:00	Dry	
BH03 (1)	SP	6.00	20/12/2019 09:36:00	Dry	
BH03 (1)	SP	6.00	06/01/2020 12:42:00	Dry	
BH04 (1)	SP	3.00	11/10/2019 14:00:00	2.13	Silty
BH04 (1)	SP	3.00	14/10/2019 09:55:00	2.41	Silty
BH04 (1)	SP	3.00	15/10/2019 08:30:00	2.18	Silty
BH04 (1)	SP	3.00	25/10/2019 12:10:00	2.62	
BH04 (1)	SP	3.00	07/11/2019 09:40:00	2.73	
BH04 (1)	SP	3.00	22/11/2019 11:22:00	Dry	Silty
BH04 (1)	SP	3.00	06/12/2019 10:40:00	Dry	
BH04 (1)	SP	3.00	20/12/2019 09:15:00	2.50	

Groundwater Monitoring

Instrument Reference	Instrument Type	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Groundwater depth, mbgl	Comments
BH04 (1)	SP	3.00	20/12/2019 09:18:00	2.50	
BH04 (1)	SP	3.00	06/01/2020 12:02:00	Dry	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

Gas Monitoring

SOCOTEC

							Gas Concentrations					
Instrument Reference	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Air Temperature, oC	Barometric Pressure, mbar	Gas Differential Pressure, Pa	Gas Flow Rate, l/hr	Carbon Dioxide, %vol	Carbon Monoxide, ppm	Hydrogen Sulphide, ppm	Nitrogen, %vol	Oxygen, %vol	Methane, %vol
BH01 (S)	4.00	25/10/2019 11:00:00	10.0	1010	0.0	0.0	0.7			78.4	20.8	0.1
BH01 (S)	4.00	25/10/2019 11:10:00	10.0	1010	0.0	0.0	0.7			78.4	20.8	0.1
BH01 (S)	4.00	07/11/2019 09:00:00	7.0	986	0.0	-0.1	0.2	0.0	0.0	78.7	21.1	0.1
BH01 (S)	4.00	07/11/2019 09:10:00	7.0	986	0.0	-0.1	0.3	0.0	0.0	78.6	21.0	0.1
BH01 (S)	4.00	22/11/2019 10:50:00	7.0	992	0.0	0.0	0.1	0.0	0.0	79.0	20.9	0.0
BH01 (S)	4.00	22/11/2019 10:50:30				0.1				79.2	19.8	
BH01 (S)	4.00	06/12/2019 09:45:00	12.0	994	-0.1	0.2	1.3	0.0	0.0		19.4	0.0
BH01 (S)	4.00	20/12/2019 10:05:00	9.0	974	0.0	0.0	1.6	1.0	0.0		19.4	2.6
BH01 (S)	4.00	20/12/2019 10:15:00	9.0	974			1.6	0.0	0.0		19.4	2.6
BH01 (S)	4.00	06/01/2020 11:15:00	8.0	1009	0.1	0.0	1.2			76.8	19.5	2.5
BH01 (S)	4.00	06/01/2020 11:16:00	8.0	1009	0.1	0.0	1.2			76.7	19.5	2.5
BH02 (D)	20.00	25/10/2019 11:20:00	10.0	1010	0.0	0.0	0.1			79.8	21.2	0.1
BH02 (D)	20.00	25/10/2019 11:30:00	10.0	1010	0.0	0.0	0.1			79.8	21.2	0.1
BH02 (S)	7.00	06/12/2019 10:00:00	12.0	996	-0.1	0.1	0.0	4.0	0.0		3.5	0.0
BH02 (S)	7.00	20/12/2019 09:45:00	9.0	974	0.1	-0.4	0.3	4.0	0.0		1.3	2.6
BH02 (S)	7.00	20/12/2019 09:50:00	9.0	974			0.1	4.0	0.0		1.3	2.6
BH02 (S)	7.00	06/01/2020 11:30:00	8.0	1009	-0.2	0.1	0.2			95.4	1.9	2.6
BH02 (S)	7.00	06/01/2020 11:31:00	8.0	1009	-0.2	0.1	0.1			95.4	1.9	2.6
BH03 (1)	6.00	25/10/2019 11:40:00	10.0	1010	0.0	0.0	0.6			82.4	16.3	0.1
BH03 (1)	6.00	25/10/2019 11:50:00	10.0	1010	0.0	0.0	0.5			82.4	17.0	0.1
BH03 (1)	6.00	07/11/2019 09:20:00	7.0	986	-0.1	-0.3	1.3	0.0	0.0	83.4	15.3	0.1
BH03 (1)	6.00	07/11/2019 09:30:00	7.0	986	-0.1	0.0	0.3	0.0	0.0	79.3	20.3	0.1
BH03 (1)	6.00	22/11/2019 11:56:00	8.0	992		0.0	1.5			83.8	14.7	0.0
BH03 (1)	6.00	22/11/2019 12:04:00	8.0	992		0.0	0.3					0.0
BH03 (1)	6.00	06/12/2019 10:25:00	12.0	996	7.0	0.1	1.9	1.0	0.0		14.6	0.0
BH03 (1)	6.00	20/12/2019 09:30:00	9.0	974	0.1	0.0	2.5	0.0	0.0		14.8	2.6
BH03 (1)	6.00	20/12/2019 09:36:00	9.0	974			0.6	0.0	0.0		19.2	2.6
BH03 (1)	6.00	06/01/2020 11:45:00	8.0	1009	-0.5	0.3	2.5			79.7	15.4	2.6
BH03 (1)	6.00	06/01/2020 11:46:00	8.0	1009	-0.5	0.1	0.5			76.3	20.7	2.5
BH04 (1)	3.00	25/10/2019 12:10:00	10.0	1010	0.0	0.0	1.3			80.2	18.5	0.1
BH04 (1)	3.00	25/10/2019 12:20:00	10.0	1010	0.0	0.0	1.3			80.2	18.5	0.1

Notes: ND - not detected

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Figure C3

Gas Monitoring

							Gas Concentrations					
Instrument Reference	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Air Temperature, oC	Barometric Pressure, mbar	Gas Differential Pressure, Pa	Gas Flow Rate, l/hr	Carbon Dioxide, %vol	Carbon Monoxide, ppm	Hydrogen Sulphide, ppm	Nitrogen, %vol	Oxygen, %vol	Methane, %vol
BH04 (1)	3.00	07/11/2019 09:40:00	7.0	986	-1.0	0.0	1.6	0.0	0.0	78.1	20.6	0.2
BH04 (1)	3.00	07/11/2019 09:50:00	7.0	986	-1.1	0.1	1.5	0.0	0.0	79.6	18.8	0.1
BH04 (1)	3.00	22/11/2019 11:16:00	7.0	992		0.1	1.0			79.1	19.8	0.0
BH04 (1)	3.00	22/11/2019 11:20:00	7.0	992		0.0	1.0			79.1	19.8	0.0
BH04 (1)	3.00	06/12/2019 10:40:00	12.0	995	-1.1	0.1	0.9	4.0	0.0		19.4	0.0
BH04 (1)	3.00	20/12/2019 09:15:00	9.0	974	-0.1	0.0	1.3	1.0	0.0		19.0	2.6
BH04 (1)	3.00	20/12/2019 09:18:00	9.0	974			1.3	0.0	0.0		19.0	2.6
BH04 (1)	3.00	06/01/2020 11:00:00	8.0	1009	0.0	0.0	1.1			76.5	19.8	2.5
BH04 (1)	3.00	06/01/2020 11:01:00	8.0	1009	0.0	0.0	1.1			76.5	19.8	2.5

Notes: ND - not detected

Project PROJECT NOMA PLOT P

Project No. A9023-19

Carried out for Buro Happold

Figure C3

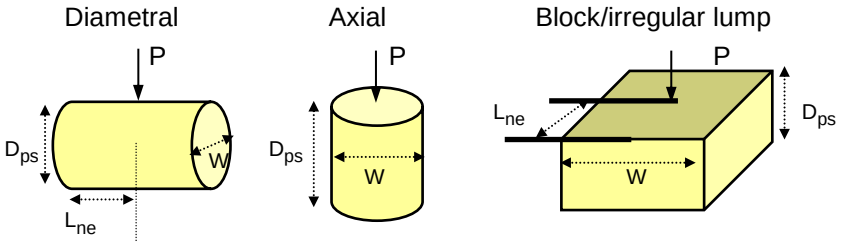
APPENDIX D
GEOTECHNICAL LABORATORY TEST RESULTS

Point Load Index Tests	PLT (2 sheets)
Uniaxial Compressive Strength of Rock – Summary of Results	UCS (1 sheet)
Test Report – Chemical Tests	EFS/203395
	EFS/203719

Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type
D - Diametral, A - Axial, I - Irregular Lump, B - Block
Direction (U = unknown or random)
L - parallel to planes of weakness
P - perpendicular to planes of weakness
Dimensions
Dps - Distance between platens (platen separation)
Dps' - at failure
Lne - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm	kN		Is	Is(50)	
BH01	10.02	1	CS	1		SANDSTONE	D	L	Y	45.0	85.5	84.0	82.0	0.10	83.75	0.01	0.02	
BH01	10.02	1	CS	2		SANDSTONE	A	P	Y		85.5	72.0	69.0	0.10	86.69	0.01	0.02	
BH01	14.37	2	CS	1		SANDSTONE	D	L	Y	85.0	86.0	83.0	82.0	0.10	83.96	0.01	0.02	
BH01	14.37	2	CS	2		SANDSTONE	A	P	Y		86.0	61.0	59.0	0.10	80.36	0.02	0.02	
BH01	14.66	21	CS	1		SANDSTONE	A	P	Y		81.2	69.0	66.0	0.10	82.59	0.01	0.02	
BH01	22.77	23	CS	1		SANDSTONE	A	P	Y		69.7	42.0	40.0	0.10	59.57	0.03	0.03	
BH01	25.33	24	CS	1		SANDSTONE	A	P	Y		71.0	45.0	41.0	0.10	60.89	0.03	0.03	
BH01	26.40	25	CS	1		SANDSTONE	A	P	Y		70.8	43.0	41.0	0.70	60.81	0.19	0.21	
BH01	27.55	26	CS	1		SANDSTONE	A	P	Y		71.5	68.0	63.0	2.23	75.71	0.39	0.47	
BH01	27.94	27	CS	1		SANDSTONE	A	P	Y		71.0	69.0	66.0	1.98	77.26	0.33	0.40	
BH02	9.33	13	CS	1		SANDSTONE	A	P	Y		82.7	66.0	58.0	0.10	78.16	0.02	0.02	
BH02	11.10	14	CS	1		SANDSTONE	A	P	Y		86.5	69.0	64.0	1.17	83.94	0.17	0.21	

QA Ref
ISRM 85
Rev 2.8
Aug 17

UKAS TESTING
1157

SOCOTEC

Project No A9023-19

Project Name PROJECT NOMA PLOT 4

Figure
PLT

The results reported relate only to the samples tested; opinions and interpretations expressed herein are outside the scope of UKAS accreditation. © Copyright 2017 SOCOTEC UK Limited

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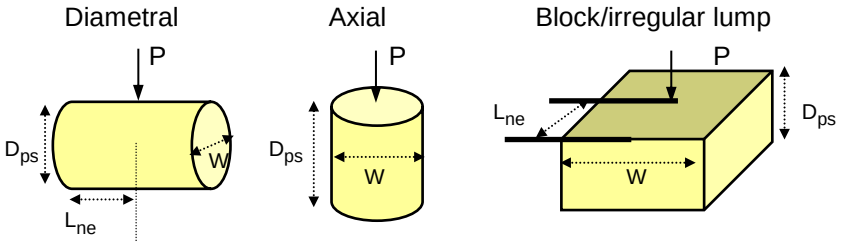
Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type
D - Diametral, A - Axial, I - Irregular Lump, B - Block
Direction (U = unknown or random)
L - parallel to planes of weakness
P - perpendicular to planes of weakness
Dimensions
Dps - Distance between platens (platen separation)
Dps' - at failure
Lne - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm	kN		Is	Is(50)	
BH02	12.96	15	CS	1		SANDSTONE	A	P	Y		85.3	61.0	59.0	0.10	80.07	0.02	0.02	
BH02	15.08	17	CS	1		SANDSTONE	A	P	Y		83.5	66.0	62.0	1.75	81.17	0.27	0.33	
BH02	17.00	18	CS	1		SANDSTONE	A	P	Y		86.1	49.0	45.0	0.10	70.22	0.02	0.02	
BH02	18.59	19	CS	1		SANDSTONE	A	P	Y		85.1	78.0	69.0	0.95	86.45	0.13	0.16	
BH02	21.13	21	CS	1		SANDSTONE	A	P	Y		86.4	49.0	45.0	1.38	70.37	0.28	0.33	
BH02	23.06	22	CS	1		SANDSTONE	A	P	Y		85.5	31.0	29.0	0.10	56.19	0.03	0.03	
BH02	24.91	23	CS	1		SANDSTONE	A	P	Y		85.9	65.0	49.0	9.31	73.22	1.74	2.06	

QA Ref
ISRM 85
Rev 2.8
Aug 17

UKAS TESTING
1157

SOCOTEC

Project No A9023-19

Project Name PROJECT NOMA PLOT 4

Figure
PLT

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Uniaxial Compressive Strength Of Rock - Summary of Results

Hole No.	Sample				Rock Type	Specimen Dimensions [2]			Bulk Density [2]	Water Content [1]	Uniaxial Compression [3]				Remarks
	No.	Depth (m)		type		Dia.	Height	H/D			Stress Rate	Time to failure	Mode of failure	UCS	
		from	to			mm	mm		Mg/m 3	%	MPa/s	secs		MPa	
BH01	3	22.37	22.50	CS	SANDSTONE	70.4	102.5	1.5	2.11	15.6	0.1	122	multiple shear	5.37	Outside ISRM Specification
BH02	5	10.07	10.21	CS	SANDSTONE	84.4	126.3	1.5	2.04	9.7	0.0	505	shear	8.59	Outside ISRM Specification
BH02	6	11.82	12.00	CS	SANDSTONE	85.4	128.8	1.5	2.12	10.4	0.0	458	shear	14.6	Outside ISRM Specification
BH02	7	19.95	20.22	CS	SANDSTONE	85.2	199.0	2.3	2.16	11.4	0.3	597	multiple shear	18.5	Outside ISRM Specification

Notes :

Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007

1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory

2 ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density

3 ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials

above notes apply unless annotated otherwise in the remarks

Mode of failure :

S - Single shear MS - multiple shear

AC - Axial cleavage F - Fragmented

QA Ref
RLR 2
Rev 2.18
Apr 19

UKAS TESTING
1157

SOCOTEC

Project No A9023-19

Project Name PROJECT NOMA PLOT 4

Figure

RUCS

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TEST REPORT

1252

Report No. EFS/203395 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 9 samples described in this report were registered for analysis by SOCOTEC UK Limited on 11-Nov-2019. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 18-Nov-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham
Operations Manager
Energy & Waste Services

Date of Issue: 18-Nov-2019

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	pH Units	pH Units												
Method Codes :			ICPWSS	ICPWSS	PHSOIL	WSLM50												
Method Reporting Limits :			10	10														
UKAS Accredited :			No	Yes	Yes	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (H2O sol) (BS1377)**	**SO4-- (H2O sol) mg/l**	**pH units (AR)**	**pH (BS1377)**												
1977836	MTP01 D 3 0.30	04-Oct-19	744			8.0												
1977837	MTP05 D 7 1.00	07-Oct-19	649			8.3												
1977838	BH02 D 6 1.00	30-Sep-19	1490			9.3												
1977839	BH02 D 11 7.50	02-Oct-19	88			6.4												
1977840	BH03 D 13 4.50	07-Oct-19	82			7.6												
1977841	BH04 B 11 4.00	09-Oct-19		15	10.2													
1977842	MTP08 B 10 2.00	08-Oct-19	19			8.3												
1977843	MTP07 B 3 0.30	07-Oct-19	166			8.3												
1977844	BH01 D 16 3.50	10-Oct-19	20			8.0												

SOCOTEC

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**18-Nov-2019**
Report Number	**EFS/203395**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S203395

Consignment No S89515
Date Logged 11-Nov-2019
In-House Report Due 20-Nov-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	ICPWSS		PHSOIL	WSLM50
		Sampled	REPORT A	SO4-- (H2O sol) (BS1377)	SO4-- (H2O sol) mg/l	pH units (AR)	pH (BS1377)
					✓	✓	
CL/1977836	MTP01 0.30	04/10/19		E			
CL/1977837	MTP05 1.00	07/10/19		E			
CL/1977838	BH02 1.00	30/09/19		E			
CL/1977839	BH02 7.50	02/10/19		E			
CL/1977840	BH03 4.50	07/10/19		E			
CL/1977841	BH04 4.00	09/10/19			E	E	
CL/1977842	MTP08 2.00	08/10/19		E			
CL/1977843	MTP07 0.30	07/10/19		E			
CL/1977844	BH01 3.50	10/10/19		E			

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A9023-19 Project Noma Plot 4

Report Number : S20_3395

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1977836	MTP01 D 3 0.30	Brown Gravel SAND Brick
CL/1977837	MTP05 D 7 1.00	Brown Gravel SILT Brick
CL/1977838	BH02 D 6 1.00	Brown Gravel SILT Brick
CL/1977839	BH02 D 11 7.50	Brown Sand SANDSTONE
CL/1977840	BH03 D 13 4.50	Brown Silt SAND Gravel
CL/1977841	BH04 B 11 4.00	Grey Sand COBBLES
CL/1977842	MTP08 B 10 2.00	Brown Silt SAND Gravel
CL/1977843	MTP07 B 3 0.30	Brown Clay SAND Brick
CL/1977844	BH01 D 16 3.50	Brown Sand SILT Gravel

TEST REPORT

Report No. EFS/203719 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 5 samples described in this report were registered for analysis by SOCOTEC UK Limited on 22-Nov-2019. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 28-Nov-2019

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham
Operations Manager
Energy & Waste Services

Date of Issue: 28-Nov-2019

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/l	pH Units														
Method Codes :			ICPWSS	WSLM50														
Method Reporting Limits :			10															
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (H2O sol) (BS1377)**	**pH (BS1377)**														
1979222	BH01 CS 20 12.90		23	7.1														
1979223	BH01 CS 22 16.50		15	8.4														
1979224	BH02 CS 16 15.00		14	7.9														
1979225	BH02 CS 20 20.05		15	8.0														
1979226	BH03 CS 15 6.50		47	5.3														

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**28-Nov-2019**
Report Number	**EFS/203719**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S203719

Consignment No S89827
Date Logged 22-Nov-2019
In-House Report Due 02-Dec-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	CustServ	ICPWSS	WSLM50
				REPORT A	SO4-- (H2O sol) (BS1377)	pH (BS1377)
CL/1979222	BH01 12.90	D		D	D	D
CL/1979223	BH01 16.50	D		D	D	D
CL/1979224	BH02 15.00-15.08	D		D	D	D
CL/1979225	BH02 20.05-20.13	D		D	D	D
CL/1979226	BH03 6.50-6.59	D		D	D	D

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A9023-19 Project Noma Plot 4

Report Number : S20_3719

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1979222	BH01 CS 20 12.90	Brown SAND
CL/1979223	BH01 CS 22 16.50	Brown Gravel SILT
CL/1979224	BH02 CS 16 15.00	Brown SAND
CL/1979225	BH02 CS 20 20.05	Brown SAND
CL/1979226	BH03 CS 15 6.50	Brown SAND

APPENDIX E
GEOENVIRONMENTAL LABORATORY TEST RESULTS

Test Report - Soil

EFS/202681
EFS/202682
EFS/202730
EFS/202891
EFS/203188

TEST REPORT

1252

Report No. EFS/202681 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 2 samples described in this report were registered for analysis by SOCOTEC UK Limited on 11-Oct-2019. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 24-Oct-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 7)
Table of WAC Analysis Results (Pages 8 to 9)
Subcontracted Analysis Reports (Pages 10 to 11)
The accreditation status of subcontracted analysis is displayed on the appended subcontracted analysis reports.
Analytical and Deviating Sample Overview (Pages 12 to 13)
Table of Additional Report Notes (Page 14)
Table of Method Descriptions (Pages 15 to 16)
Table of Report Notes (Page 17)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham Operations Manager
Energy & Waste Services

Date of Issue: 24-Oct-2019

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			Mol/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	FOCS	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA
Method Reporting Limits :			0.04	10	10	20	20	10	10	30	0.04	0.2	0.2	0.2	0.2	0.2	0.01	0.2
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**MTBE**	**o Xylene**	**Toluene**	**Xylenes**	**S.O.M. % (Calc)**	**GRO**	**GRO (>C5 - C6)**	**GRO (>C7 - C8)**	**GRO (>C8 - C10)**	**GRO (C5-C6 Aliphatic)**	**GRO (C5-C7 Aromatic)**	**GRO (C6-C7)**
1974744	MTP03 ES 2 0.50	03-Oct-19	5.80	< 10.0	< 10.0	< 20.0	< 20.0	< 10.0	< 10.0	< 30.0	3.59	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.010	< 0.200
1974745	MTP04 ES 2 0.50	03-Oct-19	3.00	< 10.0	< 10.0	< 20.0	< 20.0*	< 10.0	< 10.0	< 30.0	13.4	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.010	< 0.200

SOCOTEC

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202681**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l
Method Codes :			GROHSA	GROHSA	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS
Method Reporting Limits :			0.2	0.01	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	0.6	3	0.5	0.1	10	
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (C6-C8 Aliphatic)**	**GRO (C7-C8 Aromatic)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**	
1974744	MTP03 ES 2 0.50	03-Oct-19	< 0.200	< 0.010	4	8.3	4.73	22.3	35.9	138.6	0.12	17	0.7	1	474.1	232	0.163	534	
1974745	MTP04 ES 2 0.50	03-Oct-19	< 0.200	< 0.010	1	26.5	1.17	21.9	63	294.9	0.6	24.6	1.1	0.9	154.2	186	1.01	74	

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202681**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			0.2	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**L.O.I. % @ 450C**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Coronene**	**Dibenzo(ah)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Naphthalene**
1974744	MTP03 ES 2 0.50	03-Oct-19	4.8	0.42	0.16	1.11	3.13	3.57	3.97	2.46	1.55	3.01	0.69	0.52	6.04	0.27	2.68	0.15
1974745	MTP04 ES 2 0.50	03-Oct-19	4.9	0.82	0.25	1.11	2.50	2.31	2.76	1.31	1.00	2.42	0.37	0.35	5.50	0.58	1.55	0.52

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Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202681**
Table Number	**1**

Where individual results are flagged see report notes for status.

			Units :	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg	mg/kg		%
			Method Codes :	PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	SFAPI	Sub020	TMSS
			Method Reporting Limits :	0.08	0.08	1.28	5	5	5	5	5	5	5		0.5	0.5	0.5		0.1
			UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date		Phenanthrene	Pyrene	Total PAH (Sum of USEPA 16)	PCB 101	PCB 118	PCB 138	PCB 153	PCB 180	PCB 28	PCB 52	pH units (AR)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C
1974744	MTP03 ES 2 0.50	03-Oct-19		3.59	5.42	38.1	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	9.2	<0.5	<0.5	<0.5	CH	12.8
1974745	MTP04 ES 2 0.50	03-Oct-19		4.28	4.92	32.2	< 5.00*	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	8.8	<0.5	0.9	<0.5	AM	18.4

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Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	24-Oct-2019
Report Number	EFS/202681
Table Number	1

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		Method Codes :	TPHFIDUS	TPHFIDUS	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI
		Method Reporting Limits :	10	10	4	4	4	11.88	8.75	5.62	4	4	20	20	4	4	4	8.75
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Ali Band >C10-C12	TPH Ali Band >C12-C16	TPH Ali Band >C16-C21	TPH Ali Band >C16-C35	TPH Ali Band >C21-C35	TPH Ali Band >C35-C44	TPH Ali Band >C40-C44	TPH Ali Band >C8-C10	TPH Ali Band >C8-C40	TPH Ali Band >C8-C44	TPH Aro Band >C10-C12	TPH Aro Band >C12-C16	TPH Aro Band >C16-C21	TPH Aro Band >C21-C35
1974744	MTP03 ES 2 0.50	03-Oct-19	1050	1060	< 4.00	< 4.00	10.9	207	197	73.6	13.2	< 4.00	269	282	< 4.00	6.31	45.7	360
1974745	MTP04 ES 2 0.50	03-Oct-19	564	564	< 4.00	< 4.00	33.4	406	373	29.3	< 4.00	< 4.00	437	439	< 4.00	< 4.00	21.9	257

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Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	24-Oct-2019
Report Number	EFS/202681
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% M/M										
Method Codes :			TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	WSLM59										
Method Reporting Limits :			5.62	4	4	20	20	0.02										
UKAS Accredited :			No	No	Yes	Yes	No	Yes										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Aro Band >C35-C44**	**TPH Aro Band >C40-C44**	**TPH Aro Band >C8-C10**	**TPH Aro Band >C8-C40**	**TPH Aro Band >C8-C44**	**Total Organic Carbon**										
1974744	MTP03 ES 2 0.50	**03-Oct-19**	183	36.3	8.32	568	605	2.08										
1974745	MTP04 ES 2 0.50	**03-Oct-19**	44.9	< 4.00	< 4.00	326	329	7.8										

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202681**
Table Number	**1**

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.110
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	12.8
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.880
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
MTP03 ES 2 0.50		S20_2681	CL/1974744	24-Oct-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	2.08	3	5	6
N	LOI450	Loss on Ignition (%)	4.8			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0689	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	1200	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	44.48	100		
U	PHSOIL	pH (pH units)	9.2		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	5.8		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo	mg/kg (dry weight)			
U	WSLM3	pH (pH units) oo	8.9	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) oo	176				
U	ICPMSW	Arsenic	0.009	0.09	0.5	2	25
U	ICPWATVAR	Barium	0.01	0.1	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.004	0.04	0.5	10	70
U	ICPMSW	Copper	0.004	0.04	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.002	0.02	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.004	0.04	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.004	0.04	4	50	200
U	KONENS	Chloride	2	20	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	34	340	1000	20000	50000
N	WSLM27	Total Dissolved Solids	137	1370	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	2.8	28	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.113
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	18.4
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.878
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
MTP04 ES 2 0.50		S20_2681	CL/1974745	24-Oct-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	7.8	3	5	6
N	LOI450	Loss on Ignition (%)	4.9			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0737	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	691	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	39.91	100		
U	PHSOIL	pH (pH units)	8.8		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	3		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo	mg/kg (dry weight)			
U	WSLM3	pH (pH units) oo	7.6	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) oo	116				
U	ICPMSW	Arsenic	0.029	0.29	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.004	0.04	0.5	10	70
U	ICPMSW	Copper	0.003	0.03	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.002	0.02	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.003	0.03	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.007	0.07	4	50	200
U	KONENS	Chloride	2	20	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	8	80	1000	20000	50000
N	WSLM27	Total Dissolved Solids	90.5	905	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	1.2	12	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

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working for a healthy and sustainable world

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: S08727-1

DATE OF ISSUE: 23.10.19

DATE SAMPLES RECEIVED: 16.10.19

DATE SAMPLES ANALYSED: 21.10.19

DESCRIPTION: Two soil/loose aggregate samples.

ANALYSIS REQUESTED: Qualitative analysis of samples for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of the samples followed by detailed analysis of representative sub-samples. The sub-samples are analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

Asbestos was detected in both of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

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IOM CONSULTING LIMITED, registered in Scotland No. SC205670

UKAS TESTING
0374

CONTRACT NO: S08727-1
DATE OF ISSUE: 23.10.19

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: S202681

IOM sample number	Client sample number	ACM type detected	PLM result
S67532	S1974744 MTP03 0.50	Free Fibres	Chrysotile
S67533	S1974745 MTP04 0.50	Loose Insulation[2]	Amosite

Our detection limit for this method is 0.001%.

COMMENTS:

[1] ACM was visible during initial examination of the sample.
[2] ACM was detected during microscopic examination of the sample.

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.

AUTHORISED BY: .....
D Third
Scientific Technician

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202681

Consignment No S88612
Date Logged 11-Oct-2019
In-House Report Due 18-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ANC	BTEXHSA		CEN Leachate	CustServ	FOCS	GROHSA	ICPBOR	ICPMSS										ICPSOIL		ICPWSS	LOI(%MM)	PAHMSUS	PCBECD	PHSOIL
		Sampled	Acid Neut. Capacity	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)C	REPORT A	S.O.M. % (Calc)	GRO (AA-UK) HSA-GCFID	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	Barium.	Beryllium.	SO4-- (H2O sol) mg/l	L.O.I. % @ 450C	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)
				✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
CL/1974744	MTP03 0.50	03/10/19																									
CL/1974745	MTP04 0.50	03/10/19																									

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202681

Consignment No S88612
Date Logged 11-Oct-2019
In-House Report Due 18-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI			Sub020	TMSS	TPHFIDUS		TPHUSSI	WSLM59
		Sampled	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (Si-UKCWG)>44	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1974744	MTP03 0.50	03/10/19									
CL/1974745	MTP04 0.50	03/10/19									

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Report Number : EFS/202681

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
PCBECD	CL1974745	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB101) . These circumstances should be taken into consideration when utilising the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	ICPSOIL	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A9023-19 Project Noma Plot 4

Report Number : S20_2681

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1974744	MTP03 ES 2 0.50	Brown MADE GROUND
CL/1974745	MTP04 ES 2 0.50	Brown Gravel SAND Brick

TEST REPORT

1252

Report No. EFS/202682 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 11-Oct-2019. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 24-Oct-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 7)
Subcontracted Analysis Reports (Pages 8 to 9)
The accreditation status of subcontracted analysis is displayed on the appended subcontracted analysis reports.
Analytical and Deviating Sample Overview (Pages 10 to 11)
Table of Additional Report Notes (Page 12)
Table of Method Descriptions (Page 13)
Table of Report Notes (Page 14)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham Operations Manager
Energy & Waste Services

Date of Issue: 24-Oct-2019

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			Mol/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	FOCS	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA
Method Reporting Limits :			0.04	10	10	20	20	10	10	30	0.04	0.2	0.2	0.2	0.2	0.2	0.2	0.2
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**MTBE**	**o Xylene**	**Toluene**	**Xylenes**	**S.O.M. % (Calc)**	**GRO**	**GRO (>C5 - C6)**	**GRO (>C7 - C8)**	**GRO (>C8 - C10)**	**GRO (C5-C6 Aliphatic)**	**GRO (C6-C7 Aliphatic)**	**GRO (C6-C7)**
1974746	BH02 ES 9 2.00	01-Oct-19	4.36	< 10.0	< 10.0	< 20.0	< 20.0*	< 10.0	< 10.0	< 30.0	2.69	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200

SOCOTEC

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Client Name SOCOTEC UK Doncaster

Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202682**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l
Method Codes :			GROHSA	GROHSA	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS
Method Reporting Limits :			0.2	0.2	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	0.6	3	0.5	0.1	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (C7-C8 Aliphatic)**	**GRO (C8-C10 Aliphatic)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**
1974746	BH02 ES 9 2.00	01-Oct-19	< 0.200	< 0.200	2.3	8.6	3.3	19.3	46.2	127.2	0.16	12.6	0.7	<0.6	439.1	190	<0.1	1580

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202682**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			0.2	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**L.O.I. % @ 450C**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Coronene**	**Dibenzo(ah)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Naphthalene**
1974746	BH02 ES 9 2.00	01-Oct-19	4.1	< 0.08	< 0.08	0.21	0.87	0.95	1.13	0.60	0.38	0.93	0.18	0.16	1.46	< 0.08	0.67	0.10

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Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202682**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg	mg/kg		%
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	SFAPI	Sub020	TMSS
Method Reporting Limits :			0.08	0.08	1.28	5	5	5	5	5	5	5		0.5	0.5	0.5		0.1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**PCB 101**	**PCB 118**	**PCB 138**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**pH units (AR)**	**Cyanide(Free) (AR)**	**Cyanide(Total) (AR)**	**Phenol Index.(AR)**	**^Asbestos ID (Stage 1)**	**Tot.Moisture @ 105C**
1974746	BH02 ES 9 2.00	01-Oct-19	0.65	1.82	< 10.2	< 5.00*	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	9.8	<0.5	1.2	<0.5	NADIS	13.8

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Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202682**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		Method Codes :	TPHFIDUS	TPHFIDUS	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI
		Method Reporting Limits :	10	10	4	4	4	11.88	8.75	5.62	4	4	20	20	4	4	4	8.75
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Ali Band >C10-C12	TPH Ali Band >C12-C16	TPH Ali Band >C16-C21	TPH Ali Band >C16-C35	TPH Ali Band >C21-C35	TPH Ali Band >C35-C44	TPH Ali Band >C40-C44	TPH Ali Band >C8-C10	TPH Ali Band >C8-C40	TPH Ali Band >C8-C44	TPH Aro Band >C10-C12	TPH Aro Band >C12-C16	TPH Aro Band >C16-C21	TPH Aro Band >C21-C35
1974746	BH02 ES 9 2.00	01-Oct-19	940	940	< 4.00	< 4.00	< 4.00	12.7	11.9	< 5.62	< 4.00	< 4.00	< 20.0	< 20.0	< 4.00	< 4.00	8.71	25.1

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Client Name	SOCOTEC UK Doncaster
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	24-Oct-2019
Report Number	EFS/202682
Table Number	1

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% M/M										
Method Codes :			TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	WSLM59										
Method Reporting Limits :			5.62	4	4	20	20	0.02										
UKAS Accredited :			No	No	Yes	Yes	No	Yes										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Aro Band >C35-C44**	**TPH Aro Band >C40-C44**	**TPH Aro Band >C8-C10**	**TPH Aro Band >C8-C40**	**TPH Aro Band >C8-C44**	**Total Organic Carbon**										
1974746	BH02 ES 9 2.00	01-Oct-19	6.05	< 4.00	5.54	46.8	47.8	1.56										

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202682**
Table Number	**1**

IOM

working for a healthy and sustainable world

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: S08727-2

DATE OF ISSUE: 23.10.19

DATE SAMPLE RECEIVED: 16.10.19

DATE SAMPLE ANALYSED: 21.10.19

DESCRIPTION: One soil/loose aggregate sample.

ANALYSIS REQUESTED: Qualitative analysis of a sample for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of the sample followed by detailed analysis of a representative sub-sample. The sub-sample is analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

No asbestos was detected in the soil sample by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

www.iom-world.org

Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

IOM CONSULTING LIMITED, registered in Scotland No. SC205670

UKAS TESTING
0374

CONTRACT NO: S08727-2
DATE OF ISSUE: 23.10.19

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: S202682

IOM sample number	Client sample number	ACM type detected	PLM result
S67534	S1974746 BH02 2.00	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.

AUTHORISED BY: .....
D Third
Scientific Technician

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202682

Consignment No S88532
Date Logged 11-Oct-2019
In-House Report Due 18-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ANC	BTEXHSA		CEN Leachate	CustServ	FOCS	GROHSA	ICPBOR	ICPMSS									ICPSOIL		ICPWSS	LOI(%MM)	PAHMSUS	PCBECD	PHSOIL
		Sampled	Acid Neut. Capacity	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)C	REPORT A	S.O.M. % (Calc)	GRO (AA) by HSA GC-FID	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	Barium.	Beryllium.	SO4-- (H2O sol) mg/l	L.O.I. % @ 450C	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)
				✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
CL/1974746	BH02 2.00	01/10/19		E	E				E																		E

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202682

Consignment No S88532
Date Logged 11-Oct-2019
In-House Report Due 18-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI			Sub020	TMSS	TPHFIDUS		TPHUSSI	WSLM59
		Sampled	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (Si-UKCWG)>44	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1974746	BH02 2.00	01/10/19									

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
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E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Report Number : EFS/202682

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
PCBECD	CL1974746	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB101) . These circumstances should be taken into consideration when utilising the data.
BTEXHSA	CL1974746	The Secondary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily (including the Primary Process Control) and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation , where applicable, from the affected analytes (MTBE) . These circumstances should be taken into consideration when utilising the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	ICPSOIL	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster
Site : A9023-19 Project Noma Plot 4
Report Number : S20_2682

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1974746	BH02 ES 9 2.00	Brown MADE GROUND

TEST REPORT

1252

Report No. EFS/202730 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 3 samples described in this report were registered for analysis by SOCOTEC UK Limited on 12-Oct-2019. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 24-Oct-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 7)
Table of WAC Analysis Results (Pages 8 to 9)
Table of Asbestos Screening Results (Page 10)
Analytical and Deviating Sample Overview (Pages 11 to 12)
Table of Method Descriptions (Pages 13 to 14)
Table of Report Notes (Page 15)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham Operations Manager
Energy & Waste Services

Date of Issue: 24-Oct-2019

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			Mol/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	FOCS	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA
Method Reporting Limits :			0.04	10	10	20	20	10	10	30	0.04	0.2	0.2	0.2	0.2	0.2	0.01	0.2
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**MTBE**	**o Xylene**	**Toluene**	**Xylenes**	**S.O.M. % (Calc)**	**GRO**	**GRO (>C5 - C6)**	**GRO (>C7 - C8)**	**GRO (>C8 - C10)**	**GRO (C5-C6 Aliphatic)**	**GRO (C5-C7 Aromatic)**	**GRO (C6-C7)**
1975001	MTP01 ES 6 1.60	**04-Oct-19**		< 10.0	< 10.0	< 20.0		< 10.0	< 10.0	< 30.0	0.22	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.010	< 0.200
1975002	MTP02 ES 2 0.30	**04-Oct-19**	2.88	< 10.0	< 10.0	< 20.0	< 20.0	< 10.0	< 10.0	< 30.0	2.22	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.010	< 0.200
1975003	MTP05 ES 6 1.00	**07-Oct-19**	3.92	< 10.0	< 10.0	< 20.0	< 20.0	< 10.0	< 10.0	< 30.0	8.60	< 0.200	< 0.200	< 0.200	< 0.200	< 0.200	< 0.010	< 0.200

SOCOTEC

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Client Name SOCOTEC UK Doncaster

Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l
		Method Codes :	GROHSA	GROHSA	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS
		Method Reporting Limits :	0.2	0.01	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	0.6	3	0.5	0.1	10	
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (C6-C8 Aliphatic)**	**GRO (C7-C8 Aromatic)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**	
1975001	MTP01 ES 6 1.60	**04-Oct-19**	< 0.200	< 0.010	<0.5	6.9	<0.1	10.3	11.2	7.7	<0.1	9.5	<0.5	11.4	38.8	24.2	0.34		
1975002	MTP02 ES 2 0.30	**04-Oct-19**	< 0.200	< 0.010	1	9.2	0.43	24.8	41.2	154.4	0.24	14	0.5	22.4	190.1	326	0.39	1390	
1975003	MTP05 ES 6 1.00	**07-Oct-19**	< 0.200	< 0.010	0.9	15.7	0.51	23.6	83.9	207.5	0.2	34.4	0.9	49.2	264	476	0.99	137	

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			0.2	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**L.O.I. % @ 450C**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Coronene**	**Dibenzo(ah)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Naphthalene**
1975001	MTP01 ES 6 1.60	04-Oct-19		< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08		< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1975002	MTP02 ES 2 0.30	04-Oct-19	2.4	0.09	< 0.08	0.33	0.98	1.12	1.28	0.72	0.52	1.00	0.20	0.17	2.11	< 0.08	0.77	0.11
1975003	MTP05 ES 6 1.00	07-Oct-19	4.7	0.56	0.17	1.01	1.68	1.48	1.94	0.83	0.65	1.77	0.22	0.25	4.00	0.41	0.89	0.32

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg	mg/kg	%	%
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	SFAPI	Sub002	TMSS
Method Reporting Limits :			0.08	0.08	1.28	5	5	5	5	5	5	5		0.5	0.5	0.5		0.1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**PCB 101**	**PCB 118**	**PCB 138**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**pH units (AR)**	**Cyanide(Free) (AR)**	**Cyanide(Total) (AR)**	**Phenol Index.(AR)**	**^Asbestos Screen & ID (Stage 1)**	**Tot.Moisture @ 105C**
1975001	MTP01 ES 6 1.60	04-Oct-19	< 0.08	< 0.08	< 1.28								8.3		<0.5	<0.5		8.1
1975002	MTP02 ES 2 0.30	04-Oct-19	1.01	1.91	< 12.3	< 5.00	< 5.00	< 5.00	< 5.00	< 5.00	20.4	8.39	8.1	<0.5	<0.5	<0.5	NAIIS	15.4
1975003	MTP05 ES 6 1.00	07-Oct-19	3.66	3.53	23.1	11.8	9.57	15.4	12.2	< 5.00	< 5.00	6.81	9	<0.5	<0.5	<0.5	AM,CH	15.6

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Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			TPHFIDUS	TPHFIDUS	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI
Method Reporting Limits :			10	10	4	4	4	11.88	8.75	5.62	4	4	20	20	4	4	4	8.75	
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Band (>C10-C40)**	**TPH by GCFID (AR)**	**TPH Ali Band >C10-C12**	**TPH Ali Band >C12-C16**	**TPH Ali Band >C16-C21**	**TPH Ali Band >C16-C35**	**TPH Ali Band >C21-C35**	**TPH Ali Band >C35-C44**	**TPH Ali Band >C40-C44**	**TPH Ali Band >C8-C10**	**TPH Ali Band >C8-C40**	**TPH Ali Band >C8-C44**	**TPH Aro Band >C10-C12**	**TPH Aro Band >C12-C16**	**TPH Aro Band >C16-C21**	**TPH Aro Band >C21-C35**	
1975001	MTP01 ES 6 1.60	04-Oct-19			< 4.00	< 4.00	< 4.00	< 11.9	10.3	< 5.62	< 4.00	< 4.00	< 20.0	< 20.0	< 4.00	< 4.00	< 4.00	10.5	
1975002	MTP02 ES 2 0.30	04-Oct-19	439	439	< 4.00	< 4.00	5.57	84.4	78.8	52.2	18.0	< 4.00	121	139	< 4.00	< 4.00	7.56	110	
1975003	MTP05 ES 6 1.00	07-Oct-19	439	440	< 4.00	< 4.00	7.05	69	61.9	19.2	5.74	< 4.00	85.6	91.3	< 4.00	< 4.00	11.0	43.5	

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Client Name SOCOTEC UK Doncaster

Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% M/M										
Method Codes :			TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	WSLM59										
Method Reporting Limits :			5.62	4	4	20	20	0.02										
UKAS Accredited :			No	No	Yes	Yes	No	Yes										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Aro Band >C35-C44**	**TPH Aro Band >C40-C44**	**TPH Aro Band >C8-C10**	**TPH Aro Band >C8-C40**	**TPH Aro Band >C8-C44**	**Total Organic Carbon**										
1975001	MTP01 ES 6 1.60	04-Oct-19	< 5.62	< 4.00	6.16	22.2	22.6	0.13										
1975002	MTP02 ES 2 0.30	04-Oct-19	6.20	6.20	9.01	138	144	1.29										
1975003	MTP05 ES 6 1.00	07-Oct-19	< 5.62	< 4.00	9.04	66.0	66.1	4.99										

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Client Name SOCOTEC UK Doncaster

Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**24-Oct-2019**
Report Number	**EFS/202730**
Table Number	**1**

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.107
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	15.4
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.883
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
MTP02 ES 2 0.30		s20_2730	CL/1975002	24-Oct-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.31	3	5	6
N	LOI450	Loss on Ignition (%)	2.4			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0708	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.06402	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	519	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<14.8	100		
U	PHSOIL	pH (pH units)	8.1		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	2.92		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1		
			mg/l except oo	mg/kg (dry weight)	mg/kg (dry weight)		
U	WSLM3	pH (pH units) oo	9.3	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) oo	1240				
U	ICPMSW	Arsenic	0.013	0.13	0.5	2	25
U	ICPWATVAR	Barium	0.02	0.2	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.033	0.33	0.5	10	70
U	ICPMSW	Copper	0.027	0.27	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.007	0.07	0.06	0.7	5
U	ICPMSW	Selenium	0.001	0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.02	4	50	200
U	KONENS	Chloride	4	40	800	15000	25000
U	ISEF	Fluoride	0.6	6	10	150	500
U	ICPWATVAR	Sulphate as SO4	663	6630	1000	20000	50000
N	WSLM27	Total Dissolved Solids	963	9630	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	4.6	46	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.108
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	15.6
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.882
					Fraction of sample above 4 mm %	64.900
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
MTP05 ES 6 1.00		s20_2730	CL/1975003	24-Oct-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	4.97	3	5	6
N	LOI450	Loss on Ignition (%)	4.7			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0709	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.07811	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	520	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	27.63	100		
U	PHSOIL	pH (pH units)	9		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	3.91		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate mg/l except oo	Calculated cumulative amount mg/kg (dry weight)	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1 mg/kg (dry weight)		
U	WSLM3	pH (pH units) oo	9.3	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) oo	160				
U	ICPMSW	Arsenic	0.013	0.13	0.5	2	25
U	ICPWATVAR	Barium	0.02	0.2	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.013	0.13	0.5	10	70
U	ICPMSW	Copper	0.006	0.06	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.006	0.06	0.06	0.7	5
U	ICPMSW	Selenium	0.001	0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	0.02	4	50	200
U	KONENS	Chloride	2	20	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	40	400	1000	20000	50000
N	WSLM27	Total Dissolved Solids	125	1250	4000	60000	100000
U	SFAPI	Phenol Index	0.05	0.5	1		
N	WSLM13	Dissolved Organic Carbon	3.4	34	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

ASBESTOS ANALYSIS RESULTS

SOCOTEC Asbestos Limited Certificate of Analysis for Asbestos in Soils, Sediments and Aggregates

UKAS TESTING 1089

Detection limit of Method SCI-ASB-020 is 0.001%

Sampling has been carried out by a third party

SOCOTEC

Client:	SOCOTEC Environmental Chemistry	**Page 1 of 1**	
Address:	Etwall House, Bretby Business Park, Ashby Road, Burton upon Trent	**Report No:**	**ANO-0503-21478**
For the attention of:	SOCOTEC UK Doncaster	**Report Date:**	**23/10/2019**
Site Address:	A9023-19 Project Noma Plot 4	**Project Number:**	**S202730**

Sample Number	Sample Date	Sample Location & Matrix	Test Date	Total Sample Dry Weight (g)	Weight of <10mm Fraction (g)	Asbestos(g) in >10mm	Asbestos(g) in < 10mm	% Asbestos by weight of Total Dried Sample	Moisture Content	Asbestos Fibre Types Identified
CL/1975002	04/10/19	MTP02 0.30 Soils	23/10/2019	844.8	577.2			Identification		NAIIS
CL/1975003	07/10/19	MTP05 1.00 Soils	23/10/2019	489.1	306.3			Identification		Amosite(Lagging) & Chrysotile(Free Fibres)

Keys

NAACR = Not Analysed at Clients Request

*** visible to naked eye**

NAIIS = No Asbestos Identified in Sample (Identification Only)

NADIS = No Asbestos Detected in Sample (ID & Quant Only)

Name:	Tom Pratt	Authorised Signatory:
Position:	Lab Coordinator	

The sample analysis for the above results was carried out using the procedures detailed in SOCOTEC Asbestos Limited in house method (SCI-ASB-020) based on EA document Quantification of asbestos in soil and associated materials - Draft 2017. Fibre identification was carried out using SOCOTEC Asbestos Limited in house method of transmitted/polarised light microscopy and centre stop dispersion staining (SCI-ASB-007), based on HSE's HSG 248. The analysis of the < 10mm fraction for asbestos content only includes ACMs and fibres and does not discriminate non-asbestos fibres. All fibres are assumed, unless specified, to be amphiboles. All tests were carried out at a SOCOTEC Asbestos Ltd laboratory, UKAS Testing Number 1089. Recommended sample weight is 1kg-2kg, samples less than 1kg are classified as deviating samples.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202730

Consignment No S88613
Date Logged 12-Oct-2019
In-House Report Due 23-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	ANC	BTEXHSA		CEN Leachate	CustServ	FOCS	GROHSA	ICPBOR	ICPMSS									ICPSOIL		ICPWSS	LOI(%MM)	PAHMSUS		PCBECD
				Acid Neut. Capacity	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)C	REPORT A	S.O.M. % (Calc)	GRO (AA-UK) HSA-GCFID	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	Barium.	Beryllium.	SO4-- (H2O sol) mg/l	L.O.I. % @ 450C	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis
					✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
CL/1975001	MTP01 1.60	04/10/19																									
CL/1975002	MTP02 0.30	04/10/19																									
CL/1975003	MTP05 1.00	07/10/19																									

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202730

Consignment No S88613
Date Logged 12-Oct-2019
In-House Report Due 23-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	PHSOIL	SFAPI			Sub002	TMSS	TPHFIDUS		TPHUSSI	WSLM59
		Sampled	pH units (AR)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos Screen & ID (Stage 1)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (Si-UKCWG)>44	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1975001	MTP01 1.60	04/10/19										
CL/1975002	MTP02 0.30	04/10/19										
CL/1975003	MTP05 1.00	07/10/19										

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	ICPSOIL	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster
Site : A9023-19 Project Noma Plot 4
Report Number : S20_2730

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1975001	MTP01 ES 6 1.60	Brown Gravel SAND
CL/1975002	MTP02 ES 2 0.30	Brown MADE GROUND
CL/1975003	MTP05 ES 6 1.00	Brown MADE GROUND

TEST REPORT

1252

Report No. EFS/202891 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 2 samples described in this report were registered for analysis by SOCOTEC UK Limited on 19-Oct-2019. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 31-Oct-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 7)
Table of WAC Analysis Results (Page 8)
Subcontracted Analysis Reports (Pages 9 to 10)
The accreditation status of subcontracted analysis is displayed on the appended subcontracted analysis reports.
Analytical and Deviating Sample Overview (Pages 11 to 12)
Table of Additional Report Notes (Page 13)
Table of Method Descriptions (Pages 14 to 15)
Table of Report Notes (Page 16)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham Operations Manager
Energy & Waste Services

Date of Issue: 31-Oct-2019

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			Mol/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	FOCS	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA
Method Reporting Limits :			0.04	10	10	20	20	10	10	30	0.04	0.2	0.2	0.2	0.2	0.2	0.01	0.2
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**MTBE**	**o Xylene**	**Toluene**	**Xylenes**	**S.O.M. % (Calc)**	**GRO**	**GRO (>C5 - C6)**	**GRO (>C7 - C8)**	**GRO (>C8 - C10)**	**GRO (C5-C6 Aliphatic)**	**GRO (C5-C7 Aromatic)**	**GRO (C6-C7)**
1975793	BH3 ES 11 3.60	09-Oct-19	1.12	< 10.0 §	< 10.0 §	< 20.0 §	< 20.0 §	< 10.0 §	< 10.0 §	< 30.0 §	0.52	< 0.200 §	< 0.200* §	< 0.200 §	< 0.200 §	< 0.200* §	< 0.010 §	< 0.200 §
1975794	BH3 ES 12 4.50	09-Oct-19		< 10.0	< 10.0	< 20.0		< 10.0	< 10.0	< 30.0	0.40	0.211	< 0.200*	< 0.200	< 0.200	< 0.200*	< 0.010	< 0.200

SOCOTEC

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Burton-on-Trent, Staffordshire, DE15 0YZ

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**31-Oct-2019**
Report Number	**EFS/202891**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/l
Method Codes :			GROHSA	GROHSA	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS
Method Reporting Limits :			0.2	0.01	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	0.6	3	0.5	0.1	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (C6-C8 Aliphatic)**	**GRO (C7-C8 Aromatic)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**
1975793	BH3 ES 11 3.60	09-Oct-19	< 0.200 §	< 0.010 §	0.6 §	11.3 §	0.26 §	13.5 §	40.3 §	10.8 §	<0.1 §	24.2 §	0.5 §	16.7	55.2 §	73.2 §	0.87 §	86 §
1975794	BH3 ES 12 4.50	09-Oct-19	< 0.200	< 0.010	<0.5	9.2	0.19	11.2	25	17.7	<0.1	15.9	<0.5	18.5	48.6	34.9	0.83	

SOCOTEC

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Client Name SOCOTEC UK Doncaster

Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**31-Oct-2019**
Report Number	**EFS/202891**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			0.2	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**L.O.I. % @ 450C**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Coronene**	**Dibenzo(ah)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Naphthalene**	
1975793	BH3 ES 11 3.60	09-Oct-19	1.9	< 0.08 §	< 0.08 §	< 0.08 §	0.09 §	< 0.08 §	0.09 §	< 0.08 §	< 0.08 §	0.09 §	< 0.08	< 0.08 §	0.16 §	< 0.08 §	< 0.08 §	< 0.08 §	
1975794	BH3 ES 12 4.50	09-Oct-19		0.85	< 0.08	0.62	0.93	0.85	1.21	0.55	0.41	1.14		0.14	2.52	0.46	0.65	< 0.08	

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Contact Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**31-Oct-2019**
Report Number	**EFS/202891**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg	mg/kg		%
		Method Codes :	PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	SFAPI	Sub020	TMSS
		Method Reporting Limits :	0.08	0.08	1.28	5	5	5	5	5	5	5		0.5	0.5	0.5		0.1
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date	Phenanthrene	Pyrene	Total PAH (Sum of USEPA 16)	PCB 101	PCB 118	PCB 138	PCB 153	PCB 180	PCB 28	PCB 52	pH units (AR)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C
1975793	BH3 ES 11 3.60	09-Oct-19	0.18 §	0.15 §	< 1.56 §	< 5.00 §	< 5.00 §	< 5.00 §	< 5.00 §	< 5.00 §	< 5.00 §	< 5.00 §	8.3 §	<0.5 §	<0.5 §	<0.5 §	NADIS	12.9 §
1975794	BH3 ES 12 4.50	09-Oct-19	2.96	2.02	< 15.5								8.5		<0.5	<0.5		18.1

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Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	31-Oct-2019
Report Number	EFS/202891
Table Number	1

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		Method Codes :	TPHFIDUS	TPHFIDUS	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI
		Method Reporting Limits :	10	10	4	4	4	11.88	8.75	5.62	4	4	20	20	4	4	4	8.75
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Ali Band >C10-C12	TPH Ali Band >C12-C16	TPH Ali Band >C16-C21	TPH Ali Band >C16-C35	TPH Ali Band >C21-C35	TPH Ali Band >C35-C44	TPH Ali Band >C40-C44	TPH Ali Band >C8-C10	TPH Ali Band >C8-C40	TPH Ali Band >C8-C44	TPH Aro Band >C10-C12	TPH Aro Band >C12-C16	TPH Aro Band >C16-C21	TPH Aro Band >C21-C35
1975793	BH3 ES 11 3.60	09-Oct-19	49.6 §	49.6 §	< 4.00 §	< 4.00 §	< 4.00 §	20.6 §	18.2 §	< 5.62	< 4.00	< 4.00 §	25.2 §	25.8	< 4.00 §	< 4.00 §	5.04 §	11.6 §
1975794	BH3 ES 12 4.50	09-Oct-19			< 4.00	< 4.00	4.06	40.4	36.3	< 5.62	< 4.00	< 4.00	46.8	47.6	< 4.00	4.94	20.7	48.4

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Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	31-Oct-2019
Report Number	EFS/202891
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% M/M										
Method Codes :			TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	WSLM59										
Method Reporting Limits :			5.62	4	4	20	20	0.02										
UKAS Accredited :			No	No	Yes	Yes	No	Yes										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Aro Band >C35-C44**	**TPH Aro Band >C40-C44**	**TPH Aro Band >C8-C10**	**TPH Aro Band >C8-C40**	**TPH Aro Band >C8-C44**	**Total Organic Carbon**										
1975793	BH3 ES 11 3.60	**09-Oct-19**	< 5.62	< 4.00	< 4.00 §	21.0 §	21.5	0.30 §										
1975794	BH3 ES 12 4.50	**09-Oct-19**	< 5.62	< 4.00	< 4.00	80.9	81.3	0.23										

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**31-Oct-2019**
Report Number	**EFS/202891**
Table Number	**1**

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.105
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	12.9
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.885
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
BH3 ES 11 3.60		s20_2891	CL/1975793	31-Oct-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.303§	3	5	6
N	LOI450	Loss on Ignition (%)	1.9			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.069	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	56.95§	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.88	100		
N	PHSOIL	pH (pH units)	8.3 §		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	1.13		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1		
			mg/l except ºº	mg/kg (dry weight)	mg/kg (dry weight)		
U	WSLM3	pH (pH units) ºº	7	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) ºº	<100				
U	ICPMSW	Arsenic	0.001	0.01	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.00004	0.0004	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	0.005	0.05	2	50	100
U	ICPMSW	Mercury	0.00204	0.0204	0.01	0.2	2
U	ICPMSW	Molybdenum	0.007	0.07	0.5	10	30
U	ICPMSW	Nickel	0.002	0.02	0.4	10	40
U	ICPMSW	Lead	0.002	0.02	0.5	10	50
U	ICPMSW	Antimony	0.002	0.02	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.008	0.08	4	50	200
U	KONENS	Chloride	1	10	800	15000	25000
U	ISEF	Fluoride	0.7	7	10	150	500
U	ICPWATVAR	Sulphate as SO4	7	70	1000	20000	50000
N	WSLM27	Total Dissolved Solids	<60	<600	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	2.5	25	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202891

Consignment No S88731
Date Logged 19-Oct-2019
In-House Report Due 28-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ANC	BTEXHSA	CEN Leachate	CustServ	FOCS	GROHSA	ICPBOR	ICPMSS									ICPSOIL		ICPWSS	LOI(%MM)	PAHMSUS		PCBECD	PHSOIL
		Sampled	Acid Neut. Capacity	MTBE (µg/kg)	CEN Leac(P)C	REPORT A	S.O.M. % (Calc)	GRO (AA-UK) HSA-GCFID	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	Barium.	Beryllium.	SO4-- (H2O sol) mg/l	L.O.I. % @ 450C	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)
				✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
CL/1975793	BH3 3.60	09/10/19		E				E																			E
CL/1975794	BH3 4.50	09/10/19						E																			E

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A9023-19 Project Noma Plot 4
Report No S202891

Consignment No S88731
Date Logged 19-Oct-2019
In-House Report Due 28-Oct-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI			Sub020	TMSS	TPHFIDUS		TPHUSSI	WSLM59
		Sampled	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (SI-UKCWG)>44	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1975793	BH3 3.60	09/10/19	E	E	E						
CL/1975794	BH3 4.50	09/10/19		E	E						

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.
The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Report Number : EFS/202891

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
GROHSA	CL1975793 CL1975794	The Secondary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily (including the Primary Process Control) and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation , where applicable, from the affected analytes (C5-C6, C5-C6 ALI) . These circumstances should be taken into consideration when utilising the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	ICPSOIL	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A9023-19 Project Noma Plot 4

Report Number : S20_2891

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1975793	BH3 ES 11 3.60	Brown Clay COBBLES Sand
CL/1975794	BH3 ES 12 4.50	Brown Clay SAND Gravel

TEST REPORT

1252

Report No. EFS/203188M (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A9023-19 Project Noma Plot 4

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 01-Nov-2019. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 12-Nov-2019

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS or MCERTS accredited.
Any opinions or interpretations expressed herein are outside the scope of any UKAS accreditation held by SOCOTEC UK Limited.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 7)
Table of WAC Analysis Results (Page 8)
Subcontracted Analysis Reports (Pages 9 to 10)
The accreditation status of subcontracted analysis is displayed on the appended subcontracted analysis reports.
Analytical and Deviating Sample Overview (Pages 11 to 12)
Table of Method Descriptions (Pages 13 to 14)
Table of Report Notes (Page 15)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham Operations Manager
Energy & Waste Services

Date of Issue: 12-Nov-2019

Accreditation Codes: **N** (Not Accredited), **U** (UKAS), **UM** (UKAS & MCERTS)
Tests marked '^' have been subcontracted to another laboratory.
(NVM) - denotes the sample matrix is dissimilar to matrices upon which the MCERTS validation was based, and is therefore not accredited for MCERTS.
All results are reported on a dry weight basis at 105°C unless otherwise stated. (except QC samples)
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			Mol/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	FOCS	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA	GROHSA
Method Reporting Limits :			0.04	10	10	20	20	10	10	30	0.04	0.2	0.2	0.2	0.2	0.2	0.01	0.2
Accreditation Code:			N	UM	UM	UM	U	UM	UM	UM	N	UM	UM	UM	UM	UM	UM	UM
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**MTBE**	**o Xylene**	**Toluene**	**Xylenes**	**S.O.M. % (Calc)**	**GRO**	**GRO (>C5 - C6)**	**GRO (>C7 - C8)**	**GRO (>C8 - C10)**	**GRO (C5-C6 Aliphatic)**	**GRO (C5-C7 Aromatic)**	**GRO (C6-C7)**
1976947	MT P07 ES 4 0.50	07-Oct-19	5.32	<11.7	<11.7	<23.4	<23.4	<11.7	<11.7	<35.1	2.51	<0.234	<0.234	<0.234	<0.234	<0.234	<0.012	<0.234

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**12-Nov-2019**
Report Number	**EFS/203188M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			GROHSA	GROHSA	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPSOIL	ICPSOIL	ICPWSS
Method Reporting Limits :			0.2	0.01	0.5	0.3	0.2	1.2	1.6	0.7	0.5	2	0.5	0.6	16	0.5	0.1	10	
Accreditation Code:			UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	N	UM	UM	UM	UM	
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**GRO (C6-C8 Aliphatic)**	**GRO (C7-C8 Aromatic)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Vanadium (MS)**	**Zinc (MS)**	**Barium.**	**Beryllium.**	**SO4-- (H2O sol) mg/l**	
1976947	MT P07 ES 4 0.50	07-Oct-19	<0.234	<0.012	0.7	9.1	0.45	21.4	24.5	52.3	<0.51	17.6	<0.5	24	76.9	113	0.26	330	

SOCOTEC

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Client Name	**SOCOTEC UK Doncaster**
Contact	Dan Senkans

A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**12-Nov-2019**
Report Number	**EFS/203188M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

			Units :	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
			Method Codes :	LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
			Method Reporting Limits :	0.2	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
			Accreditation Code:	N	UM	U	U	UM	UM	UM	UM	UM	UM	N	UM	UM	UM	UM	UM
LAB ID Number CL/	Client Sample Description	Sample Date	L.O.I. % @ 450C	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Coronene	Dibenzo(ah)anthracene	Fluoranthene	Fluorene	Indeno(123-cd)pyrene	Naphthalene	
1976947	MT P07 ES 4 0.50	07-Oct-19	2.5	0.54	<0.09	0.90	1.93	1.95	2.33	1.05	0.83	1.86	0.26	0.23	4.50	0.42	1.38	0.27	

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Sample Analysis

Date Printed	12-Nov-2019
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Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg	mg/kg		%
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	SFAPI	Sub020	TMSS
Method Reporting Limits :			0.08	0.08	1.28	5	5	5	5	5	5	5		0.5	0.5	0.5		0.1
Accreditation Code:			UM	UM	U	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	U	U	U
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**PCB 101**	**PCB 118**	**PCB 138**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**pH units (AR)**	**Cyanide(Free) (AR)**	**Cyanide(Total) (AR)**	**Phenol Index.(AR)**	**^Asbestos ID (Stage 1)**	**Tot.Moisture @ 105C**
1976947	MT P07 ES 4 0.50	07-Oct-19	3.16	3.94	<25.4	<5.85	<5.85	<5.85	<5.85	<5.85	<5.85	<5.85	9.4	<0.6	<0.6	<0.6	NADIS	14.5

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Sample Analysis

Date Printed	**12-Nov-2019**
Report Number	**EFS/203188M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		Method Codes :	TPHFIDUS	TPHFIDUS	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI
		Method Reporting Limits :	10	10	4	4	4	11.88	8.75	5.62	4	4	20	20	4	4	4	8.75
		Accreditation Code:	U	UM	U	U	U	U	U	N	N	U	U	N	U	U	U	U
LAB ID Number CL/	Client Sample Description	Sample Date	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Ali Band >C10-C12	TPH Ali Band >C12-C16	TPH Ali Band >C16-C21	TPH Ali Band >C16-C35	TPH Ali Band >C21-C35	TPH Ali Band >C35-C44	TPH Ali Band >C40-C44	TPH Ali Band >C8-C10	TPH Ali Band >C8-C40	TPH Ali Band >C8-C44	TPH Aro Band >C10-C12	TPH Aro Band >C12-C16	TPH Aro Band >C16-C21	TPH Aro Band >C21-C35
1976947	MT P07 ES 4 0.50	07-Oct-19	384	384	<4.68	12.2	21.6	77.9	56.3	15.8	<4.68	<4.68	103.0	106.8	<4.68	6.37	20.4	110.2

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Sample Analysis

Date Printed	12-Nov-2019
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Table Number	1

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% M/M										
Method Codes :			TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	TPHUSSI	WSLM59										
Method Reporting Limits :			5.62	4	4	20	20	0.02										
Accreditation Code:			N	N	U	U	N	N										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Aro Band >C35-C44**	**TPH Aro Band >C40-C44**	**TPH Aro Band >C8-C10**	**TPH Aro Band >C8-C40**	**TPH Aro Band >C8-C44**	**Total Organic Carbon**										
1976947	MT P07 ES 4 0.50	07-Oct-19	40.4	11.8	<4.68	170	181	1.45										

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A9023-19 Project Noma Plot 4

Sample Analysis

Date Printed	**12-Nov-2019**
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Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Doncaster				**Leaching Data**	
					Weight of sample (kg)	0.102
Contact	Dan Senkans				Moisture content @ 105°C (% of Wet Weight)	14.5
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	A9023-19 Project Noma Plot 4				Volume of water required to carry out 10:1 stage (litres)	0.888
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
MT P07 ES 4 0.50		s20_3188M	CL/1976947	12-Nov-19		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.45	3	5	6
N	LOI450	Loss on Ignition (%)	2.5			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0702	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	384	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<25.64	100		
U	PHSOIL	pH (pH units)	9.4		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	5.32		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1		
			mg/l except ºº	mg/kg (dry weight)	mg/kg (dry weight)		
U	WSLM3	pH (pH units) ºº	9.2	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) ºº	134				
U	ICPMSW	Arsenic	0.01	0.1	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.005	0.05	0.5	10	70
U	ICPMSW	Copper	0.004	0.04	2	50	100
U	ICPMSW	Mercury	<0.00003	<0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.005	0.05	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.002	0.02	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	0.02	4	50	200
U	KONENS	Chloride	2	20	800	15000	25000
U	ISEF	Fluoride	0.4	4	10	150	500
U	ICPWATVAR	Sulphate as SO4	38	380	1000	20000	50000
N	WSLM27	Total Dissolved Solids	104	1040	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	2.8	28	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

IOM

working for a healthy and sustainable world

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: S09160-5

DATE OF ISSUE: 12.11.19

DATE SAMPLE RECEIVED: 05.11.19

DATE SAMPLE ANALYSED: 12.11.19

DESCRIPTION: One soil/loose aggregate sample.

ANALYSIS REQUESTED: Qualitative analysis of a sample for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of the sample followed by detailed analysis of a representative sub-sample. The sub-sample is analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

No asbestos was detected in the soil sample by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

www.iom-world.org

Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

IOM CONSULTING LIMITED, registered in Scotland No. SC205670

UKAS TESTING
0374

CONTRACT NO: S09160-5
DATE OF ISSUE: 12.11.19

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: S203188

IOM sample number	Client sample number	ACM type detected	PLM result
S68164	S1976947 MT P07 0.50	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

AUTHORISED BY: .....
D Third
Scientific Technician

Analytical and Deviating Sample Overview

Customer **SOCOTEC UK Doncaster**
Site **A9023-19 Project Noma Plot 4**
Report No **S203188M**

Consignment No S89168
Date Logged 01-Nov-2019
In-House Report Due 12-Nov-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ANC	BTEXHSA		CEN Leachate	CustServ	FOCS	GROHSA	ICPBOR	ICPMSS										ICPSOIL		ICPWSS	LOI(%MM)	MCertS	PAHMSUS	PCBECD
		Sampled	Acid Neut. Capacity	BTEX-HSA + MTBE analysis	MTBE (µg/kg)	CEN Leac(P)C	REPORT A	S.O.M. % (Calc)	GRO (AA-UK) HSA-GCFID	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Vanadium (MS)	Zinc (MS)	Barium.	Beryllium.	SO4-- (H2O sol) mg/l	L.O.I. % @ 450C	MCertS Analysis	PAH (17) by GCMS	PCB-7 Congeners Analysis
				✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓
CL/1976947	MT P07 0.50	07/10/19		E	E				E	E													E			E	E

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.
The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer **SOCOTEC UK Doncaster**
Site **A9023-19 Project Noma Plot 4**
Report No **S203188M**

Consignment No S89168
Date Logged 01-Nov-2019
In-House Report Due 12-Nov-2019

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	PHSOIL	SFAPI			Sub020	TMSS	TPHFIDUS		TPHUSSI	WSLM59
		Sampled	pH units (AR)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (Si-UKCWG)>44	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1976947	MT P07 0.50	07/10/19	E	E	E	E		E	E	E	E	E

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
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C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.
The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	FOCS	Oven Dried @ < 35°C	Calculation of Soil Organic Matter content from Organic Carbon content of soil samples
Soil	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace GCFID
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	ICPSOIL	Oven Dried @ < 35°C	Determination of Metals in soil samples by aqua regia digestion followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	TPHUSSI	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection including quantitation of Aromatic and Aliphatic fractions.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster
Site : A9023-19 Project Noma Plot 4
Report Number : S20_3188

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1976947	MT P07 ES 4 0.50	Brown MADE GROUND

APPENDIX F
PHOTOGRAPHS

Trial Pits	Plate 1 to 22
Rotary and Concrete Cores	Plate 23 to 35

Photographs



HTP3-Face A

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	1
	Carried out for	Buro Happold	

Photographs



HTP3-Face B



HTP4-Face A

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	2
	Carried out for	Buro Happold	

Photographs



HTP4-Face B

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	3
	Carried out for	Buro Happold	

Photographs



MTP01-Face A



MTP01-Face A1

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	4
	Carried out for	Buro Happold	

Photographs



MTP01-Face B

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	5
	Carried out for	Buro Happold	

Photographs



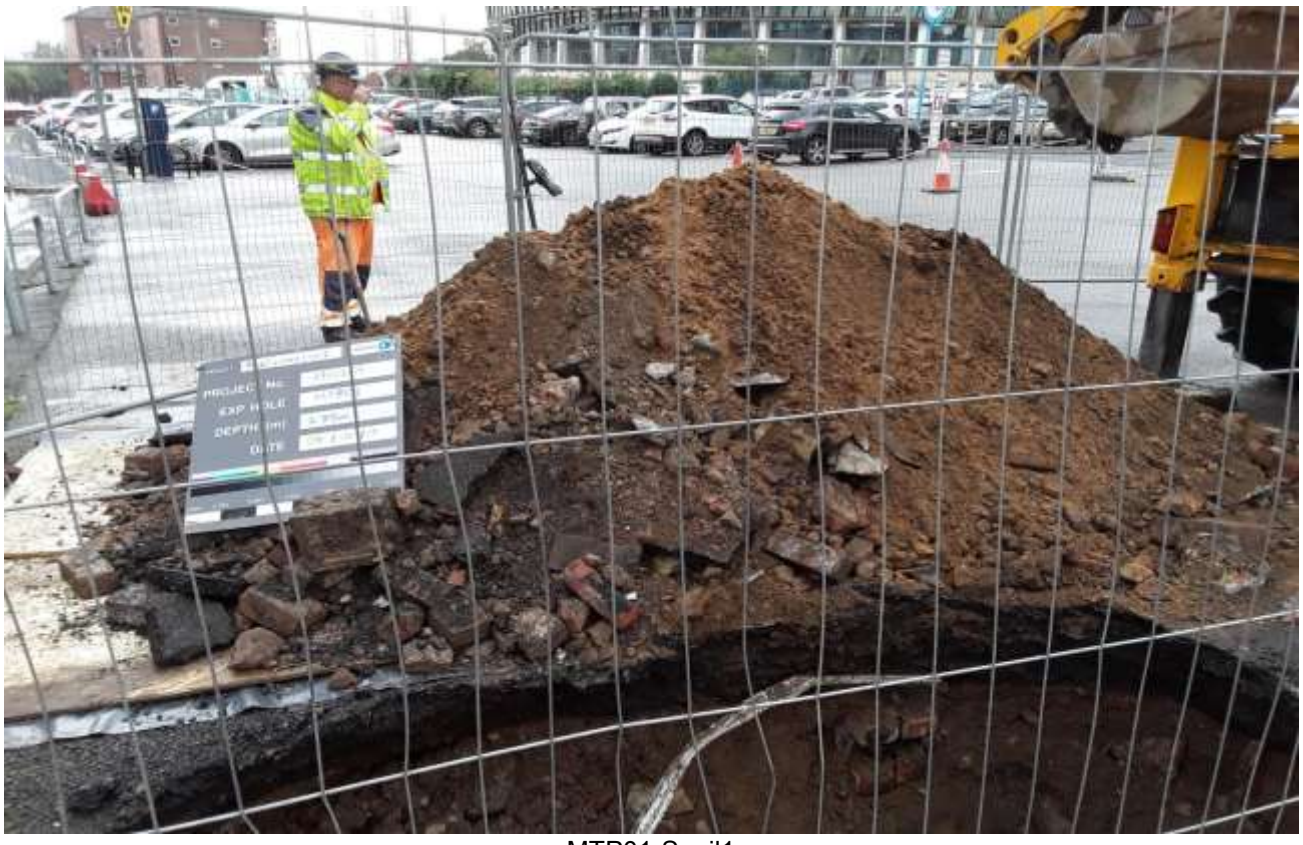
MTP01-Face B1

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	6
	Carried out for	Buro Happold	

Photographs



MTP01-Spoil



MTP01-Spoil1

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	7
	Carried out for	Buro Happold	

Photographs



MTP02-Face A

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	8
	Carried out for	Buro Happold	

Photographs



MTP02-Face B



MTP02-Spoil

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	9
	Carried out for	Buro Happold	

Photographs



MTP03_Spoil_12_31_23

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	10
	Carried out for	Buro Happold	

Photographs



MTP03-Face B



MTP03-Face C

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	11
	Carried out for	Buro Happold	

Photographs



MTP03-Spoil



MTP04-Face A

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	12
	Carried out for	Buro Happold	

Photographs



MTP04-Face D



MTP04-Spoil

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	13
	Carried out for	Buro Happold	

Photographs



MTP05-Face B

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	14
	Carried out for	Buro Happold	

Photographs



MTP05-Face C



MTP05-Spoil

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	15
	Carried out for	Buro Happold	

Photographs



MTP06-Face B

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	16
	Carried out for	Buro Happold	

Photographs



MTP06-Face D

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	17
	Carried out for	Buro Happold	

Photographs



MTP07-Face A

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	18
	Carried out for	Buro Happold	

Photographs



MTP07-Face B

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	19
	Carried out for	Buro Happold	

Photographs



MTP07-Spoil

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	20
	Carried out for	Buro Happold	

Photographs



MTP08-Face D



MTP08-Face D1

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	21
	Carried out for	Buro Happold	

Photographs



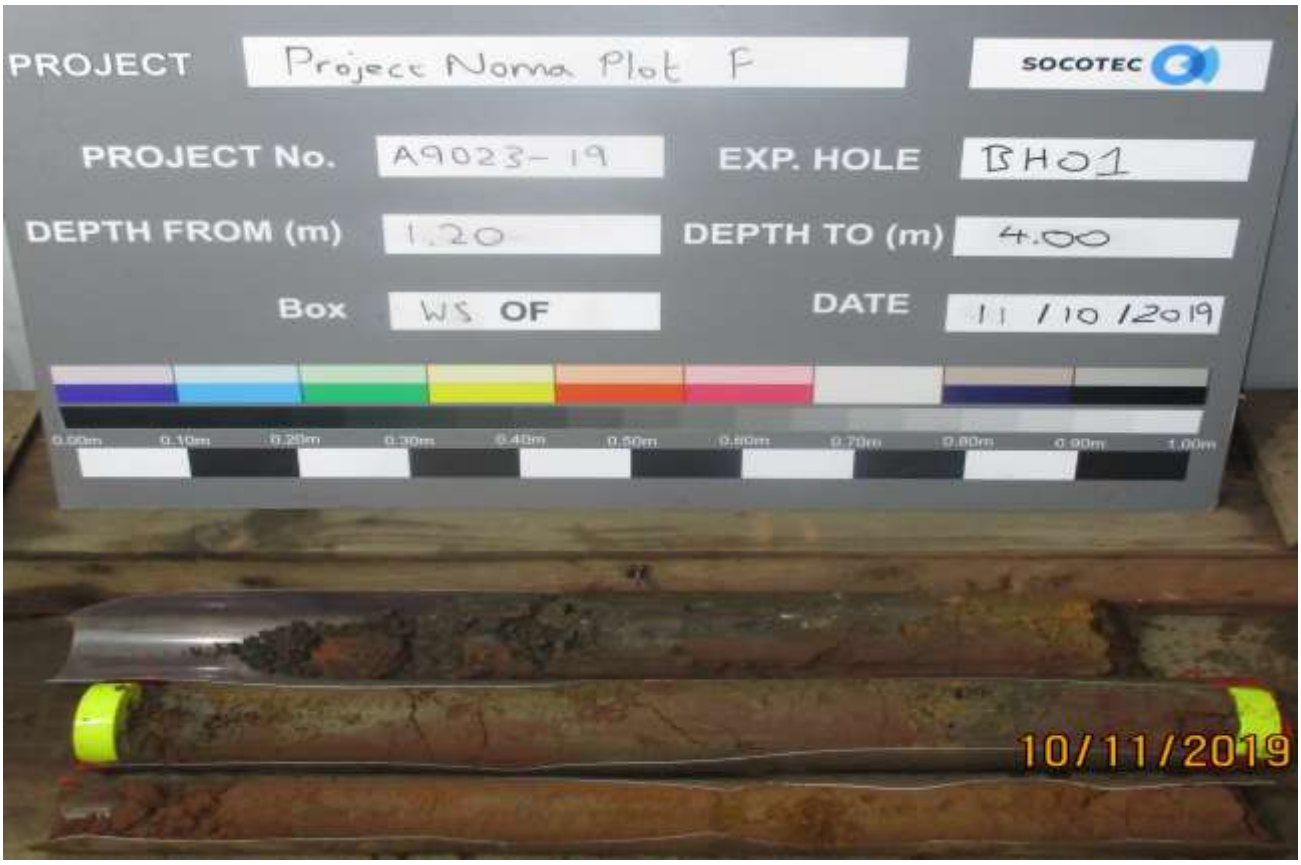
MTP08-Spoil

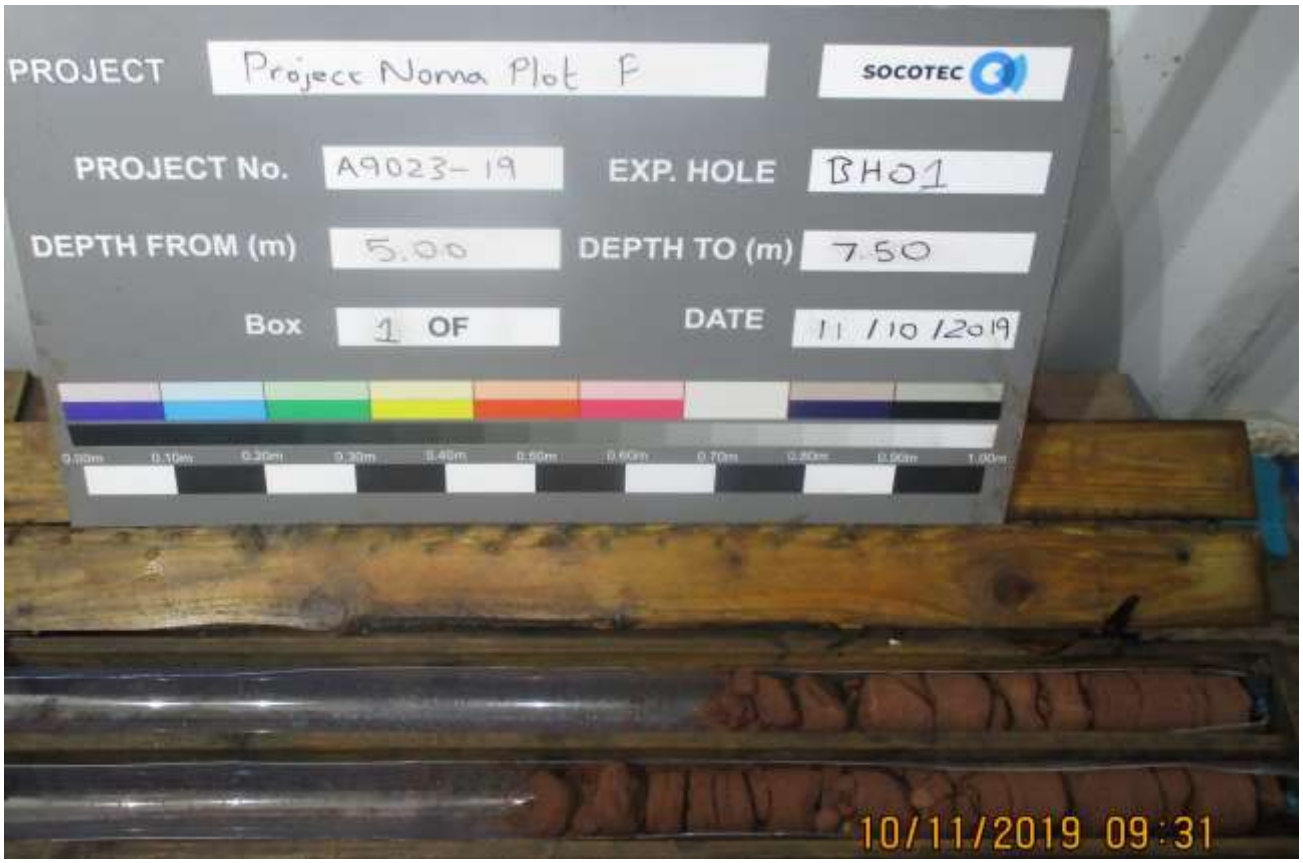


MTP08-Spoil1

Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	22
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	23
	Carried out for	Buro Happold	

Photographs

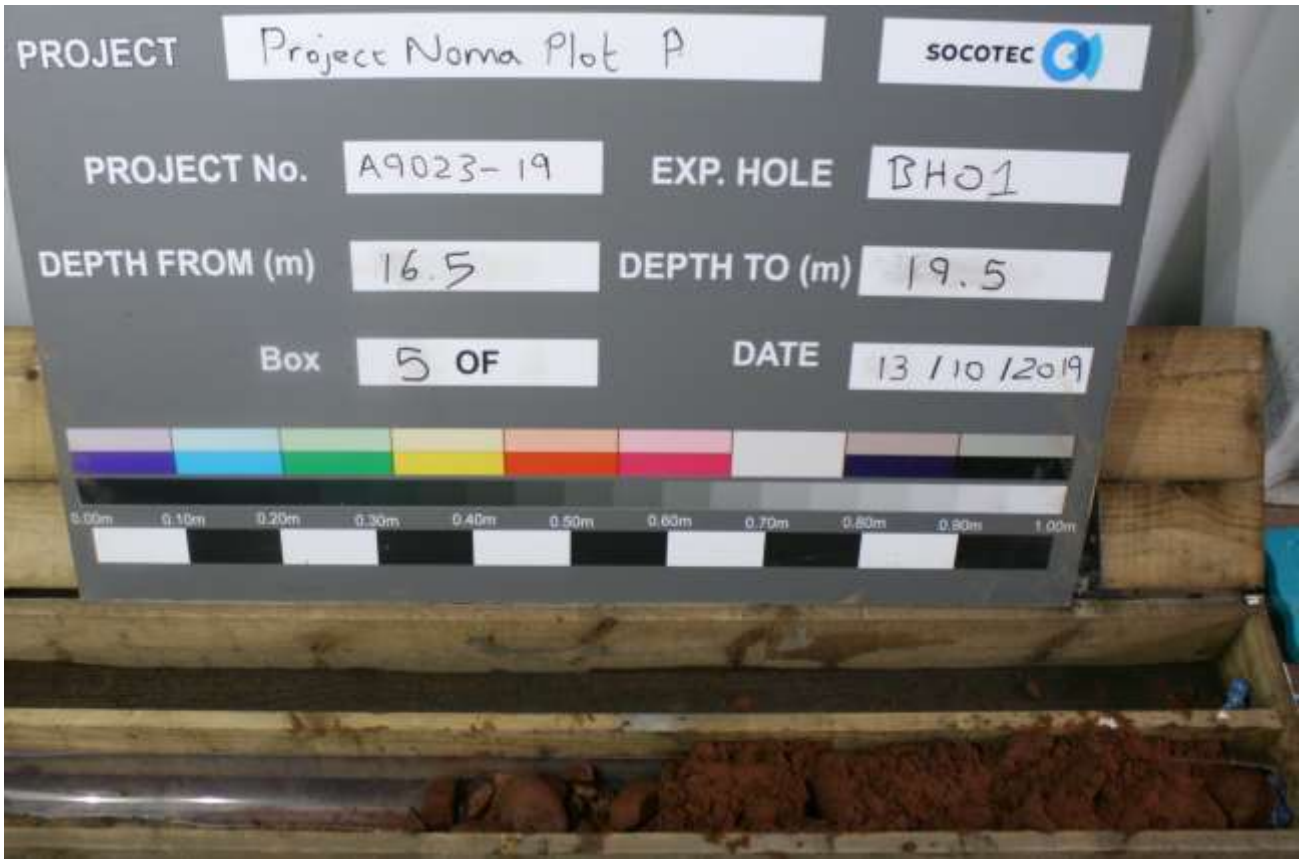




Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	24
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	25
	Carried out for	Buro Happold	

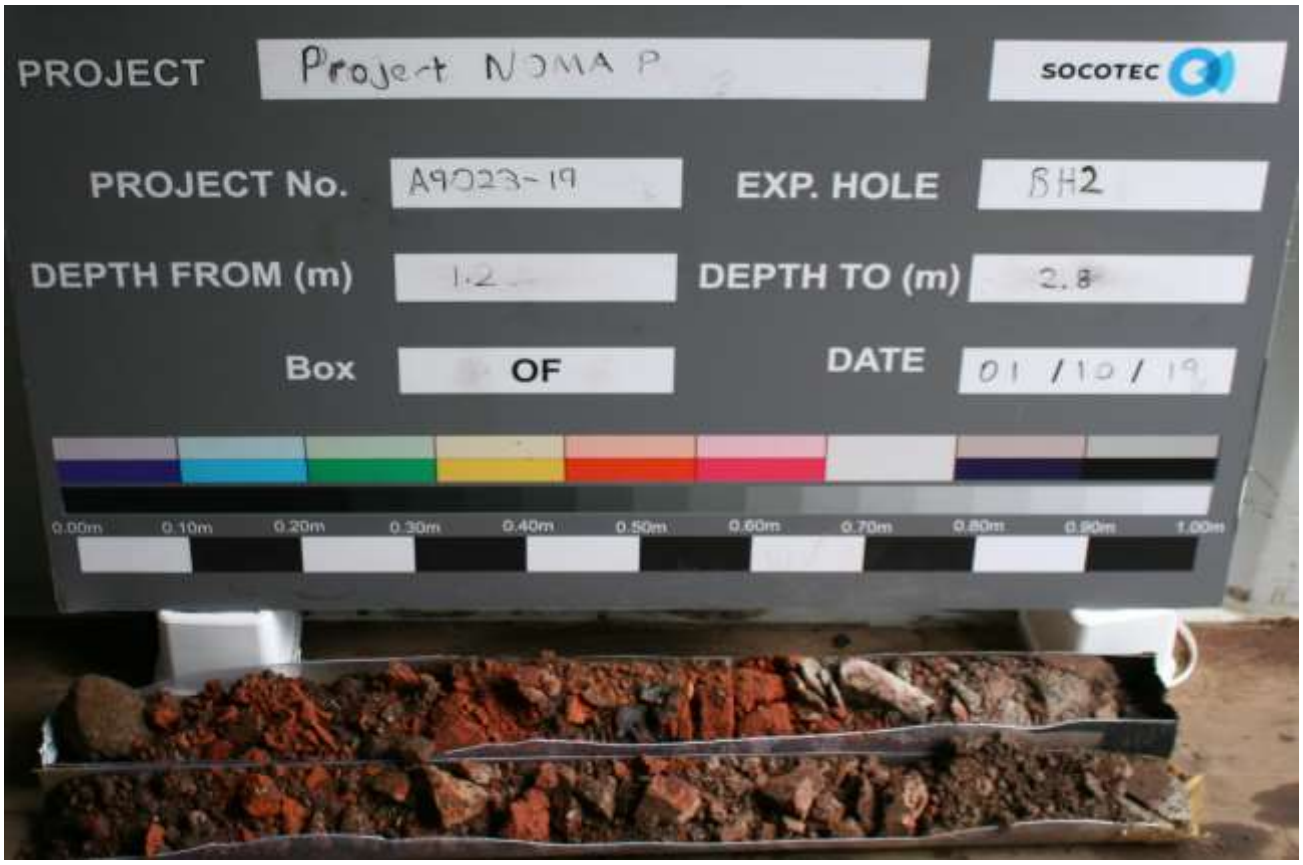
Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	26
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	27
	Carried out for	Buro Happold	

Photographs

SOCOTEC





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	28
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	29
	Carried out for	Buro Happold	

Photographs

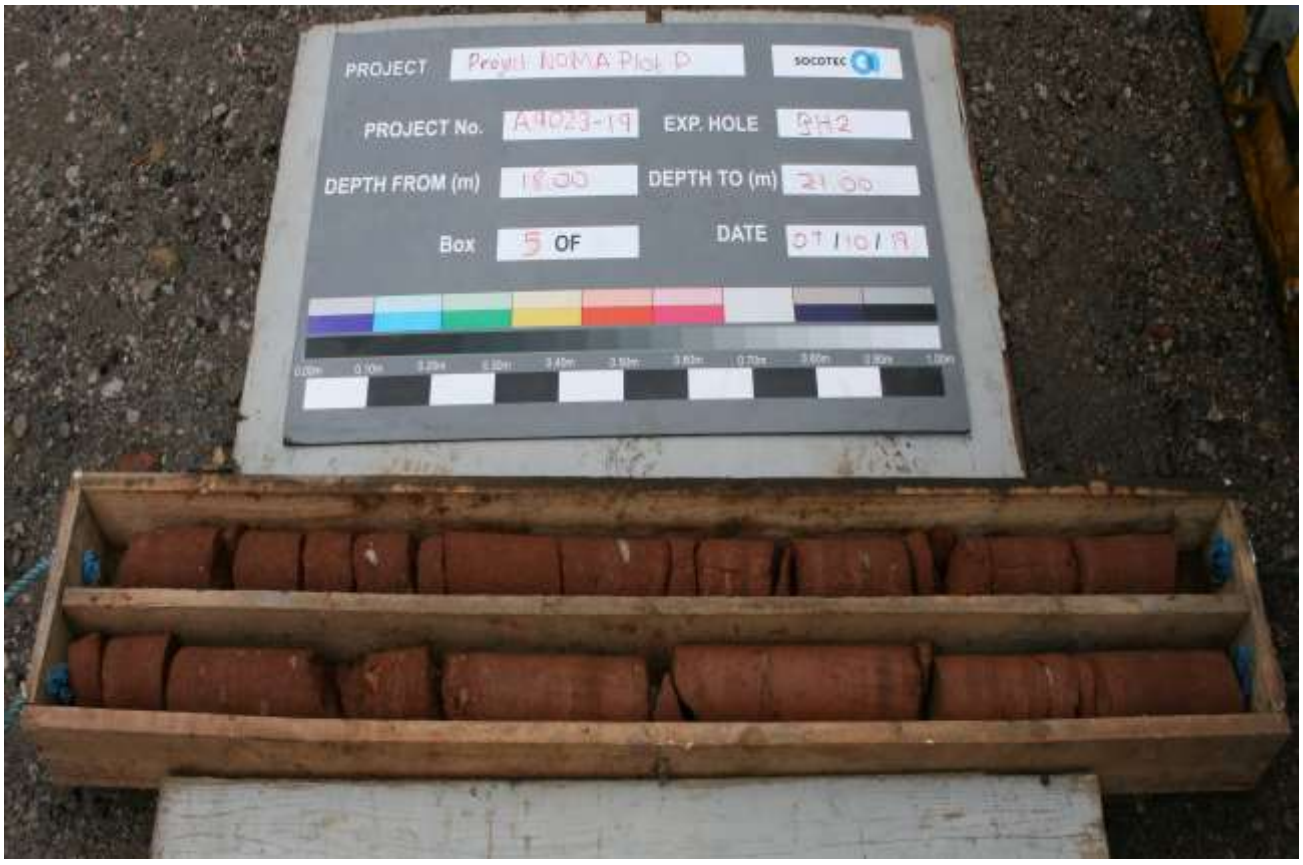




Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	30
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	31
	Carried out for	Buro Happold	

Photographs

SOCOTEC

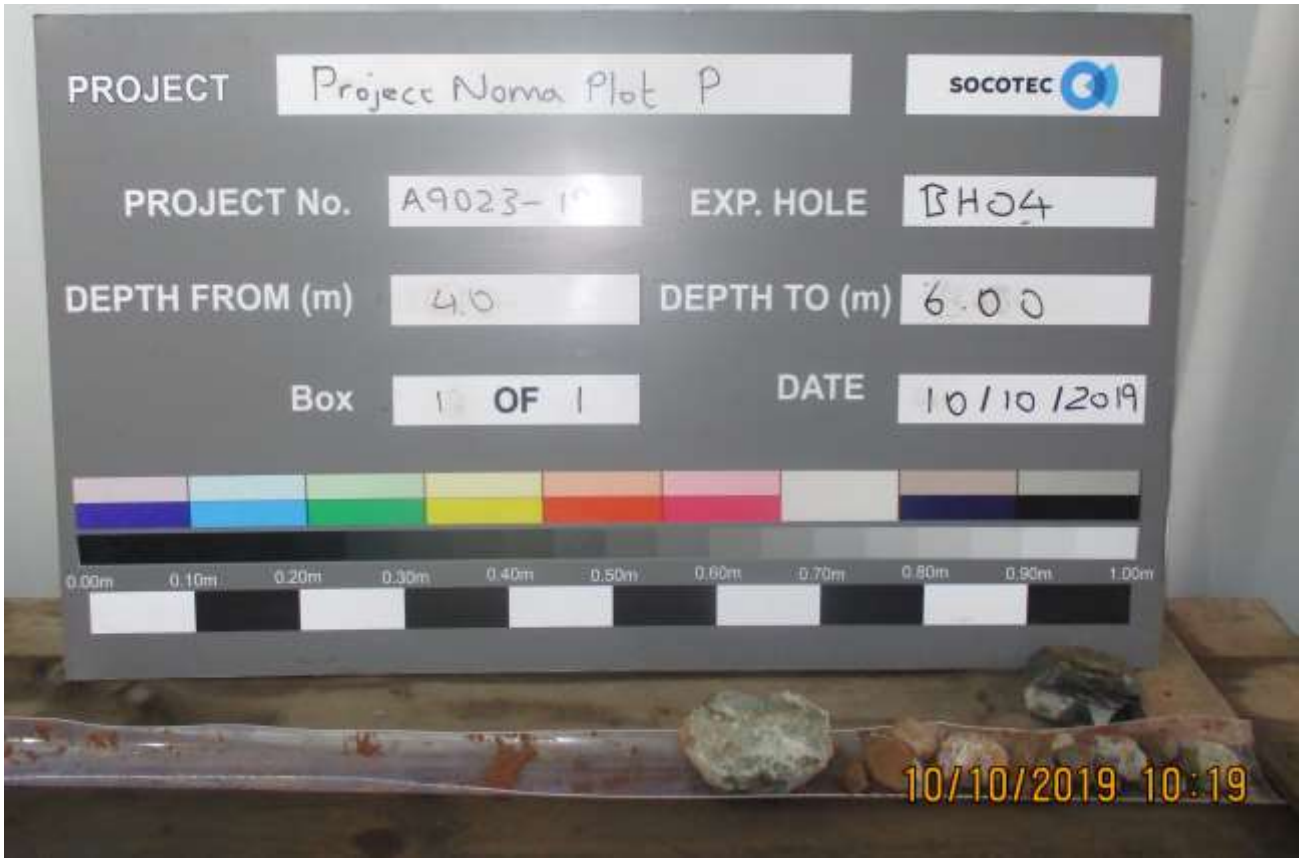




Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	32
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	33
	Carried out for	Buro Happold	

Photographs





Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	34
	Carried out for	Buro Happold	

Photographs



Notes:	Project	PROJECT NOMA PLOT P	Plate
	Project No.	A9023-19	35
	Carried out for	Buro Happold	