

**Determination of Water Content and Unconfined
Compressive Strength
(Tested Externally)**



BOREHOLE		BH SBC014A	
SAMPLE		C	
DEPTH	m	17.10	
SAMPLE DIAMETER	mm	85.47	
SAMPLE HEIGHT	mm	176.25	
TEST CONDITION		As Received	
RATE OF LOADING	kN/s	0.6	
TEST DURATION	min.sec	5.15	
DATE OF TESTING		01/04/2021	
LOAD FRAME USED		2000kN	
LOAD DIRECTION WITH RESPECT TO LITHOLOGY		Unknown	
FAILURE LOAD	kN	182.9	
UNCONFINED COMPRESSIVE STRENGTH	MPa	31.9	
WATER CONTENT (ISRM Suggested Methods)	%	8.7	
BULK DENSITY (ISRM Suggested Methods)	Mg/m ³	2.34	
DRY DENSITY (ISRM Suggested Methods)	Mg/m ³	2.15	

BOREHOLE		BH SBC014A	
SAMPLE		C	
DEPTH	m	21.67	
SAMPLE DIAMETER	mm	85.56	
SAMPLE HEIGHT	mm	175.59	
TEST CONDITION		As Received	
RATE OF LOADING	kN/s	0.02	
TEST DURATION	min.sec	2.05	
DATE OF TESTING		01/04/2021	
LOAD FRAME USED		2000kN	
LOAD DIRECTION WITH RESPECT TO LITHOLOGY		Unknown	
FAILURE LOAD	kN	2.1	
UNCONFINED COMPRESSIVE STRENGTH	MPa	0.365	
WATER CONTENT (ISRM Suggested Methods)	%	16.2	
BULK DENSITY (ISRM Suggested Methods)	Mg/m ³	2.18	
DRY DENSITY (ISRM Suggested Methods)	Mg/m ³	1.88	

BOREHOLE			
SAMPLE			
DEPTH	m		
SAMPLE DIAMETER	mm		
SAMPLE HEIGHT	mm		
TEST CONDITION			
RATE OF LOADING	kN/s		
TEST DURATION	min.sec		
DATE OF TESTING			
LOAD FRAME USED			
LOAD DIRECTION WITH RESPECT TO LITHOLOGY			
FAILURE LOAD	kN		
UNCONFINED COMPRESSIVE STRENGTH	MPa		
WATER CONTENT (ISRM Suggested Methods)	%		
BULK DENSITY (ISRM Suggested Methods)	Mg/m ³		
DRY DENSITY (ISRM Suggested Methods)	Mg/m ³		

Tested in accordance with ASTM D7012 - 14

SUMMARY OF UNCONFINED COMPRESSIVE STRENGTH

**Specialist Chemical Testing
(Tested Externally)**





DETS

Certificate of Analysis

Certificate Number 21-04298

Issued: 09-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04298

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 8 Soil samples, 6 Leachate samples.

Date Received 02-Mar-21

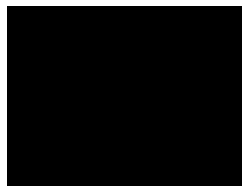
Date Started 02-Mar-21

Date Completed 09-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Contracts Manager



2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC027	2	0.2	1809525	09/03/2021	Brown sandy, gravelly CLAY including odd rootlets
TP SBC027	13	4	1809526	09/03/2021	Brown sandy, gravelly CLAY
TP SBC005	2	0.2	1809527	09/03/2021	Brown sandy, gravelly CLAY including odd rootlets
TP SBC005	9	2.5	1809528	09/03/2021	Brown sandy, gravelly CLAY
TP SBC028	2	0.2	1809529	09/03/2021	Brown sandy, gravelly CLAY
TP SBC028	20	5	1809530	09/03/2021	Brown sandy, gravelly CLAY
TP SBC029	3	0.3	1809531	09/03/2021	Brown sandy, gravelly CLAY including odd rootlets
BH SBC011	3	0.2	1809532	09/03/2021	Brown sandy CLAY

Summary of Chemical Analysis Soil Samples

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809525	1809526	1809527	1809528	1809529	1809530
Sample ID	TP SBC027	TP SBC027	TP SBC005	TP SBC005	TP SBC028	TP SBC028
Depth	0.20	4.00	0.20	2.50	0.20	5.00
Other ID	2	13	2	9	2	20
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	6.8	7.0	5.9	5.6	6.0	4.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	< 0.2	0.8	< 0.2	0.7	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.2	0.2	0.2	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	18	16	12	11	12	8.3
Chromium III	DETSC 2301*	0.15	mg/kg	18	16	12	11	12	8.3
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	25	13	17	15	14
Lead	DETSC 2301#	0.3	mg/kg	37	17	35	38	38	14
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	6.7	27	7.2	6.3	6.0	16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	51	72	57	46	46	44
Inorganics									
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.2	4.9	7.1	3.7	8.2	3.1
pH	DETSC 2008#		pH	7.5	8.4	6.8	8.3	7.5	8.3
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	0.2	< 0.1	0.2	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.8	1.1	1.4	< 0.1	2.8	0.6
Organic matter	DETSC 2002#	0.1	%	1.4	1.9	2.5	< 0.1	4.8	1.0
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	32	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	472	849	737	346	702	961
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10

Summary of Chemical Analysis Soil Samples

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809525	1809526	1809527	1809528	1809529	1809530
.Sample ID	TP SBC027	TP SBC027	TP SBC005	TP SBC005	TP SBC028	TP SBC028
Depth	0.20	4.00	0.20	2.50	0.20	5.00
Other ID	2	13	2	9	2	20
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03	< 0.03	0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	0.04	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.04	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis Soil Samples

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

	1809531	1809532
Lab No	1809531	1809532
Sample ID	TP SBC029	BH SBC011
Depth	0.30	0.20
Other ID	3	3
Sample Type	ES	ES
Sampling Date	25/02/2021	25/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	7.6	7.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.4
Chromium	DETSC 2301#	0.15	mg/kg	18	13
Chromium III	DETSC 2301*	0.15	mg/kg	18	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	18	16
Lead	DETSC 2301#	0.3	mg/kg	27	37
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.0	9.2
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	45	69
Inorganics					
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.4	5.6
pH	DETSC 2008#		pH	7.1	7.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.5	1.1
Organic matter	DETSC 2002#	0.1	%	0.9	1.9
Sulphide	DETSC 2024*	10	mg/kg	36	20
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	287	581
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10

Summary of Chemical Analysis Soil Samples

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809531	1809532
Sample ID	TP SBC029	BH SBC011
Depth	0.30	0.20
Other ID	3	3
Sample Type	ES	ES
Sampling Date	25/02/2021	25/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.12
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.09
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.06
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.46
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1809526 1809533 1809534

Sample Id TP SBC027 13 4.00

Date Analysed 09/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.0	3	5	6
DETSC 2003# Loss On Ignition	%	4.9	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.17	< 0.16	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	5.5	5.9	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	0.56	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.11	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.44	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	6.1	1.7	0.012	0.024	4	50	200
DETSC 2055 Chloride as Cl	1300	870	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	120	< 100	0.24	0.19	10	150	500
DETSC 2055 Sulphate as SO4	3800	2100	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	27000	16000	54	177.6	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2800	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	7.9	7.4
DETSC 2009 Conductivity uS/cm	38.5	22.7
* Temperature*	16.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.125

Stage 1

Volume of Leachant L2*	0.235
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.999
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC005 9 2.50

Sample Numbers 1809528 1809535 1809536

Date Analysed 09/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.8	3	5	6
DETSC 2003# Loss On Ignition	%	3.7	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	7.2	6.2	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	0.28	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	0.5	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.44	0.13	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	0.52	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	8.9	4.1	0.018	0.049	4	50	200
DETSC 2055 Chloride as Cl	2100	940	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	2800	1100	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	32000	19000	64	211.7	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	7.1	7.0
DETSC 2009 Conductivity uS/cm	45.0	27.3
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.120

Stage 1

Volume of Leachant L2*	0.22
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.959
Volume of Eluate VE2*	0.911

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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v2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1809530 1809537 1809538

Sample Id TP SBC028 20 5.00

Date Analysed 09/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.1	3	5	6
DETSC 2003# Loss On Ignition	%	3.1	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	4.4	13	< 0.02	0.12	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	0.47	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	0.74	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2000	890	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	3500	1400	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	27000	17000	54	186.6	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.8	6.7
DETSC 2009 Conductivity uS/cm	38.6	23.6
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.120

Stage 1

Volume of Leachant L2*	0.231
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.962
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04298

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1809525	TP SBC027 2 0.20	SOIL	NAD	none	Lee Kerridge
1809527	TP SBC005 2 0.20	SOIL	NAD	none	Lee Kerridge
1809529	TP SBC028 2 0.20	SOIL	NAD	none	Lee Kerridge
1809531	TP SBC029 3 0.30	SOIL	NAD	none	Lee Kerridge
1809532	BH SBC011 3 0.20	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04298
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1809525	TP SBC027 0.20 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809526	TP SBC027 4.00 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809527	TP SBC005 0.20 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809528	TP SBC005 2.50 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809529	TP SBC028 0.20 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809530	TP SBC028 5.00 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809531	TP SBC029 0.30 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809532	BH SBC011 0.20 SOIL	25/02/21	GJ 250ml, GJ 60ml x2, PT 1L x2		
1809533	TP SBC027 4.00 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809534	TP SBC027 4.00 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809535	TP SBC005 2.50 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809536	TP SBC005 2.50 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809537	TP SBC028 5.00 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809538	TP SBC028 5.00 LEACHATE	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS 2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04296

Issued: 15-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04296

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 13 Soil samples, 12 Leachate samples.

Date Received 02-Mar-21

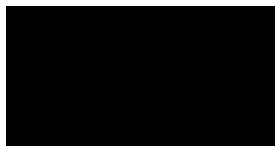
Date Started 02-Mar-21

Date Completed 15-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC008	2	0.2	1809497	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC010	5	1	1809498	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC006	3	0.4	1809499	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC006	10	2.2	1809500	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC012	3	0.4	1809501	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
BH SBC008	4	1	1809502	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
BH SBC010	2	0.2	1809503	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC014	3	0.3	1809504	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC014	15	3	1809505	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC012A	7	2.2	1809506	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC026	2	0.2	1809507	10/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC026	10	2.5	1809508	10/03/2021	Dark brown very gravelly, sandy CLAY
WS SBC004	3	0.3	1809509	10/03/2021	Dark brown very gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809497	1809498	1809499	1809500	1809501
Sample ID	TP SBC008	TP SBC010	TP SBC006	TP SBC006	TP SBC012
Depth	0.20	1.00	0.40	2.20	0.40
Other ID	2	5	3	10	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/02/2021	23/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	5.2	9.0	8.2	6.5	6.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	< 0.2	0.5	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.1	0.4	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	20	25	17	13	13
Chromium III	DETSC 2301*	0.15	mg/kg	20	25	17	13	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	12	20	21	21	17
Lead	DETSC 2301#	0.3	mg/kg	25	23	28	21	32
Mercury	DETSC 2325#	0.05	mg/kg	0.08	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	16	28	24	23	8.7
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	49	56	59	68	60
Inorganics								
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.8	3.4	4.4	3.2	3.7
pH	DETSC 2008#		pH	6.5	7.1	7.6	7.9	7.5
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.7	< 0.1	0.7	0.6	0.6
Organic matter	DETSC 2002#	0.1	%	1.1	< 0.1	1.2	1.1	1.0
Sulphide	DETSC 2024*	10	mg/kg	16	20	16	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	527	215	669	615	418

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809497	1809498	1809499	1809500	1809501
Sample ID	TP SBC008	TP SBC010	TP SBC006	TP SBC006	TP SBC012
Depth	0.20	1.00	0.40	2.20	0.40
Other ID	2	5	3	10	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/02/2021	23/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809497	1809498	1809499	1809500	1809501
Sample ID	TP SBC008	TP SBC010	TP SBC006	TP SBC006	TP SBC012
Depth	0.20	1.00	0.40	2.20	0.40
Other ID	2	5	3	10	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/02/2021	23/02/2021	25/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.05	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	0.09	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.08	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	0.06	< 0.03	0.04
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.05	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.05	< 0.03	0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.05	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg					
Acenaphthylene	DETSC 3301	0.1	mg/kg					
Acenaphthene	DETSC 3301	0.1	mg/kg					
Fluorene	DETSC 3301	0.1	mg/kg					
Phenanthrene	DETSC 3301	0.1	mg/kg					
Anthracene	DETSC 3301	0.1	mg/kg					
Fluoranthene	DETSC 3301	0.1	mg/kg					
Pyrene	DETSC 3301	0.1	mg/kg					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg					
Chrysene	DETSC 3301	0.1	mg/kg					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg					
Coronene	DETSC 3301*	0.1	mg/kg					
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	0.47	< 0.10	< 0.10
PAH Total	DETSC 3301	1.6	mg/kg					
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809502	1809503	1809504	1809505	1809506
Sample ID	BH SBC008	BH SBC010	TP SBC014	TP SBC014	TP SBC012A
Depth	1.00	0.20	0.30	3.00	2.20
Other ID	4	2	3	15	7
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	24/02/2021	24/02/2021	24/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1809502	1809503	1809504	1809505	1809506
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	4.3	6.3	6.0	8.4	16
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	3.9	0.8	0.6	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.5	0.3	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	29	18	11	14	18
Chromium III	DETSC 2301*	0.15	mg/kg	29	18	11	14	18
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	9.8	17	15	25	27
Lead	DETSC 2301#	0.3	mg/kg	3.5	37	23	21	37
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	2.2	16	11	25	33
Selenium	DETSC 2301#	0.5	mg/kg	2.1	< 0.5	0.6	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	20	74	63	67	82
Inorganics								
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.9	7.0	3.3	5.0	7.9
pH	DETSC 2008#		pH	9.1	6.4	8.0	8.1	7.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.7	1.0	0.6	0.9	0.6
Organic matter	DETSC 2002#	0.1	%	2.9	1.8	1.1	1.5	1.1
Sulphide	DETSC 2024*	10	mg/kg	32	12	< 10	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	9270	738	537	443	6320

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809502	1809503	1809504	1809505	1809506
Sample ID	BH SBC008	BH SBC010	TP SBC014	TP SBC014	TP SBC012A
Depth	1.00	0.20	0.30	3.00	2.20
Other ID	4	2	3	15	7
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	24/02/2021	24/02/2021	24/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	5.5	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	65	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	250	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	360	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	23	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	640	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	640	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809502	1809503	1809504	1809505	1809506
Sample ID	BH SBC008	BH SBC010	TP SBC014	TP SBC014	TP SBC012A
Depth	1.00	0.20	0.30	3.00	2.20
Other ID	4	2	3	15	7
Sample Type	ES	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	24/02/2021	24/02/2021	24/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	2.6	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	2.7	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	10	0.06	< 0.03	0.04	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	2.9	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	14	0.11	< 0.03	0.06	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	12	0.09	< 0.03	0.06	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	5.8	0.07	< 0.03	0.05	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	4.7	0.05	< 0.03	0.04	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	4.7	0.07	< 0.03	0.04	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	2.1	0.04	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	4.1	0.04	< 0.03	0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	1.5	0.04	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.48	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	1.5	0.03	< 0.03	< 0.03	< 0.03
Naphthalene	DETSC 3301	0.1	mg/kg					
Acenaphthylene	DETSC 3301	0.1	mg/kg					
Acenaphthene	DETSC 3301	0.1	mg/kg					
Fluorene	DETSC 3301	0.1	mg/kg					
Phenanthrene	DETSC 3301	0.1	mg/kg					
Anthracene	DETSC 3301	0.1	mg/kg					
Fluoranthene	DETSC 3301	0.1	mg/kg					
Pyrene	DETSC 3301	0.1	mg/kg					
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg					
Chrysene	DETSC 3301	0.1	mg/kg					
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg					
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg					
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg					
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg					
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg					
Coronene	DETSC 3301*	0.1	mg/kg					
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	69	0.53	< 0.10	0.30	< 0.10
PAH Total	DETSC 3301	1.6	mg/kg					
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809507	1809508	1809509
Sample ID	TP SBC026	TP SBC026	WS SBC004
Depth	0.20	2.50	0.30
Other ID	2	10	3
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	5.0	7.1	1.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5	< 0.2	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.4	0.4
Chromium	DETSC 2301#	0.15	mg/kg	9.1	13	8.1
Chromium III	DETSC 2301*	0.15	mg/kg	9.1	13	8.1
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	12	25	9.6
Lead	DETSC 2301#	0.3	mg/kg	31	26	9.0
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	5.7	23	2.7
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.6
Zinc	DETSC 2301#	1	mg/kg	33	75	37
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.4	4.3	4.6
pH	DETSC 2008#		pH	6.6	8.1	9.7
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.6	1.1	2.8
Organic matter	DETSC 2002#	0.1	%	1.1	1.8	4.8
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	16
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	565	402	1760

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809507	1809508	1809509
Sample ID	TP SBC026	TP SBC026	WS SBC004
Depth	0.20	2.50	0.30
Other ID	2	10	3
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	6.0
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	12
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	140
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	68
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	210
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	2.8
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	59
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	310
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	790
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	190
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	1300
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	1500
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1809507	1809508	1809509
Sample ID	TP SBC026	TP SBC026	WS SBC004
Depth	0.20	2.50	0.30
Other ID	2	10	3
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	
Naphthalene	DETSC 3301	0.1	mg/kg			9.3
Acenaphthylene	DETSC 3301	0.1	mg/kg			4.2
Acenaphthene	DETSC 3301	0.1	mg/kg			46
Fluorene	DETSC 3301	0.1	mg/kg			64
Phenanthrene	DETSC 3301	0.1	mg/kg			340
Anthracene	DETSC 3301	0.1	mg/kg			84
Fluoranthene	DETSC 3301	0.1	mg/kg			530
Pyrene	DETSC 3301	0.1	mg/kg			400
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg			200
Chrysene	DETSC 3301	0.1	mg/kg			200
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg			84
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg			77
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg			140
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg			21
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg			< 1.0
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg			91
Coronene	DETSC 3301*	0.1	mg/kg			< 1.0
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	
PAH Total	DETSC 3301	1.6	mg/kg			2300
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1809498 1809510 1809511

Sample Id TP SBC010 5 1.00

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	< 0.5
DETSC 2003# Loss On Ignition	%	3.4
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.24	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	4.1	2.1	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.43	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.56	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	0.022	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	2	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.21	0.11	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	1	0.41	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	3.5	< 1.3	0.007	< 0.01
DETSC 2055 Chloride as Cl	1600	1100	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	2800	1200	< 20	< 100
DETSC 2009* Total Dissolved Solids	12000	5000	24	58.4
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.3	6.3
DETSC 2009 Conductivity uS/cm	16.4	7.2
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.116

Stage 1

Volume of Leachant L2*	0.209
Volume of Eluate VE1*	0.14

Stage 2

Volume of Leachant L8*	0.93
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC006 10 2.20

Sample Numbers 1809500 1809512 1809513

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.8
DETSC 2003# Loss On Ignition	%	3.2
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	8.9	3.5	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.39	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.77	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.34	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	4.4	< 1.3	0.009	< 0.01
DETSC 2055 Chloride as Cl	3000	670	< 20	< 100
DETSC 2055* Fluoride as F	130	< 100	0.26	0.22
DETSC 2055 Sulphate as SO4	30000	4200	60	< 100
DETSC 2009* Total Dissolved Solids	86000	25000	172	352.6
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.3	6.6
DETSC 2009 Conductivity uS/cm	123.0	35.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.119

Stage 1

Volume of Leachant L2*	0.217
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.951
Volume of Eluate VE2*	0.911

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC014 15 3.00

Sample Numbers 1809505 1809514 1809515

Date Analysed 10/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.9			3	5	6
DETSC 2003# Loss On Ignition	%	5.0			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETSC2008# pH	pH Units				n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg				n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg				n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	6.9	4.1	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.31	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.64	0.47	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2.4	3	0.005	0.03	4	50	200
DETSC 2055 Chloride as Cl	2000	530	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	2500	640	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	29000	18000	58	189.1	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	6.5	6.8
DETSC 2009 Conductivity uS/cm	41.1	25.7
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.122
Stage 1	
Volume of Leachant L2*	0.225
Volume of Eluate VE1*	0.1
Stage 2	
Volume of Leachant L8*	0.972
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC012A 7 2.20

Sample Numbers 1809506 1809516 1809517

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.6
DETSC 2003# Loss On Ignition	%	7.9
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.19	0.21	< 0.002	< 0.01
DETSC 2306 Barium as Ba	6.7	3.3	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	< 0.40	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	0.1	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	1900	550	< 20	< 100
DETSC 2055* Fluoride as F	390	140	0.78	1.83
DETSC 2055 Sulphate as SO4	3000	760	< 20	< 100
DETSC 2009* Total Dissolved Solids	25000	6900	50	100.5
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.6	6.7
DETSC 2009 Conductivity uS/cm	35.6	9.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.115

Stage 1

Volume of Leachant L2*	0.205
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.92
Volume of Eluate VE2*	0.85

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC026 10 2.50

Sample Numbers 1809508 1809518 1809519

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.7
DETSC 2003# Loss On Ignition	%	4.3
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	13	8.8	0.03	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.57	0.44	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	2000	680	< 20	< 100
DETSC 2055* Fluoride as F	190	< 100	0.38	0.31
DETSC 2055 Sulphate as SO4	2500	600	< 20	< 100
DETSC 2009* Total Dissolved Solids	39000	20000	78	230.9
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.5	6.9
DETSC 2009 Conductivity uS/cm	55.7	27.9
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.123

Stage 1

Volume of Leachant L2*	0.229
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.983
Volume of Eluate VE2*	0.944

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id WS SBC004 3 0.30

Sample Numbers 1809509 1809520 1809521

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	5.3
DETSC 2003# Loss On Ignition	%	4.6
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	15000.0
DETSC 3301 PAHs	mg/kg	2300.0
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.33	0.4	< 0.002	< 0.01
DETSC 2306 Barium as Ba	9.3	4	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.43	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	2	0.96	0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.69	0.18	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.64	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	3.7	3.4	0.007	0.034
DETSC 2055 Chloride as Cl	2400	430	< 20	< 100
DETSC 2055* Fluoride as F	170	< 100	0.34	0.28
DETSC 2055 Sulphate as SO4	8600	1100	< 20	< 100
DETSC 2009* Total Dissolved Solids	43000	16000	86	204.9
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	5.9	6.0
DETSC 2009 Conductivity uS/cm	60.7	22.8
* Temperature*	20.0	22.0

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.123

Stage 1

Volume of Leachant L2*	0.238
Volume of Eluate VE1*	0.204

Stage 2

Volume of Leachant L8*	0.982
Volume of Eluate VE2*	0.94

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04296

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1809497	TP SBC008 2 0.20	SOIL	NAD	none	Michael Kay
1809499	TP SBC006 3 0.40	SOIL	NAD	none	Michael Kay
1809501	TP SBC012 3 0.40	SOIL	NAD	none	Michael Kay
1809502	BH SBC008 4 1.00	SOIL	NAD	none	Michael Kay
1809503	BH SBC010 2 0.20	SOIL	NAD	none	Michael Kay
1809504	TP SBC014 3 0.30	SOIL	NAD	none	Michael Kay
1809507	TP SBC026 2 0.20	SOIL	NAD	none	Michael Kay
1809509	WS SBC004 3 0.30	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04296

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1809497	TP SBC008 0.20 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809498	TP SBC010 1.00 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809499	TP SBC006 0.40 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809500	TP SBC006 2.20 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809501	TP SBC012 0.40 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809502	BH SBC008 1.00 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809503	BH SBC010 0.20 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809504	TP SBC014 0.30 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809505	TP SBC014 3.00 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809506	TP SBC012A 2.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809507	TP SBC026 0.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809508	TP SBC026 2.50 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809509	WS SBC004 0.30 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2		
1809510	TP SBC010 1.00 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809511	TP SBC010 1.00 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809512	TP SBC006 2.20 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809513	TP SBC006 2.20 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809514	TP SBC014 3.00 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809515	TP SBC014 3.00 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809516	TP SBC012A 2.20 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809517	TP SBC012A 2.20 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809518	TP SBC026 2.50 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809519	TP SBC026 2.50 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809520	WS SBC004 0.30 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1809521	WS SBC004 0.30 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04241

Issued: 15-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04241

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme D Section 9

Description 7 Soil samples, 4 Leachate samples.

Date Received 01-Mar-21

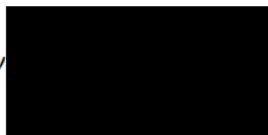
Date Started 01-Mar-21

Date Completed 15-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC011	3	0.3	1808905	08/03/2021	Brown gravelly, sandy CLAY
TP SBC011	12	3	1808906	08/03/2021	Dark grey, gravelly, sandy and CLAY
BH SBC006	1	0.1	1808907	08/03/2021	Dark brown gravelly, sandy CLAY (Possible made ground - slag)
BH SBC006	4	1	1808908	08/03/2021	Brown slightly gravelly, sandy CLAY
TP SBC024	2	0.2	1808909	08/03/2021	Dark brown sandy CLAY
TP SBC025	2	0.2	1808910	08/03/2021	Dark brown sandy CLAY including odd rootlets
BH SBC014A	1	0.2	1808911	08/03/2021	Dark brown sandy CLAY including numerous rootlets

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1808905	1808906	1808907	1808908
Sample ID	TP SBC011	TP SBC011	BH SBC006	BH SBC006
Depth	0.30	3.00	0.10	1.00
Other ID	3	12	1	4
Sample Type	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/03/2021	23/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	5.7	6.3	6.0	3.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	< 0.2	0.6	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	15	16	16	7.3
Chromium III	DETSC 2301*	0.15	mg/kg	15	16	16	7.3
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	15	26	56	15
Lead	DETSC 2301#	0.3	mg/kg	25	19	19	20
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	11	25	26	8.3
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	52	83	50	41
Inorganics							
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	3.2	4.4	4.6	2.8
pH	DETSC 2008#		pH	6.9	8.2	8.0	8.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	1.2	0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.3	0.9	3.0	0.8
Organic matter	DETSC 2002#	0.1	%	0.6	1.6	5.3	1.5
Sulphide	DETSC 2024*	10	mg/kg	< 10	16	140	20
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	405	871	1120	603

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1808905	1808906	1808907	1808908
Sample ID	TP SBC011	TP SBC011	BH SBC006	BH SBC006
Depth	0.30	3.00	0.10	1.00
Other ID	3	12	1	4
Sample Type	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/03/2021	23/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.06	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.19	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1808905	1808906	1808907	1808908
Sample ID	TP SBC011	TP SBC011	BH SBC006	BH SBC006
Depth	0.30	3.00	0.10	1.00
Other ID	3	12	1	4
Sample Type	ES	ES	ES	ES
Sampling Date	23/02/2021	23/02/2021	23/03/2021	23/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.09	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.09	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.78	0.23
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.13	0.04
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	1.1	0.39
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.83	0.28
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.26	0.12
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.33	0.14
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.22	0.11
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.09	0.04
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.14	0.06
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.08	0.05
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.07	0.04
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	4.2	1.5
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section

Lab No	1808909	1808910	1808911
Sample ID	TP SBC024	TP SBC025	BH SBC014A
Depth	0.20	0.20	0.20
Other ID	2	2	1
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	5.9	4.0	4.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	0.5	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	18	15	12
Chromium III	DETSC 2301*	0.15	mg/kg	18	15	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	23	26	15
Lead	DETSC 2301#	0.3	mg/kg	37	41	42
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.2	8.5	7.5
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	68	55	69
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.1	6.5	13
pH	DETSC 2008#		pH	7.4	6.7	6.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.2
Total Organic Carbon	DETSC 2002	0.1	%	1.5	1.9	4.1
Organic matter	DETSC 2002#	0.1	%	2.5	3.4	7.1
Sulphide	DETSC 2024*	10	mg/kg	36	20	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	682	823	1250

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section

Lab No	1808909	1808910	1808911
Sample ID	TP SBC024	TP SBC025	BH SBC014A
Depth	0.20	0.20	0.20
Other ID	2	2	1
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section

Lab No	1808909	1808910	1808911
Sample ID	TP SBC024	TP SBC025	BH SBC014A
Depth	0.20	0.20	0.20
Other ID	2	2	1
Sample Type	ES	ES	ES
Sampling Date	24/02/2021	24/02/2021	23/02/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.09
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.06
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	0.19
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	0.7

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Sample Id TP SBC011 12 3.00

Sample Numbers 1808906 1808912 1808913

Date Analysed 08/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.9	3	5	6
DETSC 2003# Loss On Ignition	%	4.4	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	0.38	0.38	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	2.3	2.1	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.63	0.56	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	0.1	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	6100	4300	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	3100	1900	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	40000	27000	80	291	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	5.7	6.4
DETSC 2009 Conductivity uS/cm	57.1	38.0
* Temperature*	23.0	20.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.124
Stage 1	
Volume of Leachant L2*	0.231
Volume of Eluate VE1*	0.2
Stage 2	
Volume of Leachant L8*	0.989
Volume of Eluate VE2*	0.94

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Sample Id BH SBC006 1 0.10

Sample Numbers 1808907 1808914 1808915

Date Analysed 08/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	15.0			3	5	6
DETSC 2003# Loss On Ignition	%	4.6			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	90.0			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	13.0			100	n/a	n/a
DETSC2008# pH	pH Units				n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg				n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg				n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	2	1.8	0.004	0.018	0.5	2	25
DETSC 2306 Barium as Ba	16	5.5	0.03	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	0.04	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.42	0.45	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	2.9	2.2	0.006	0.023	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	0.015	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	1.6	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	0.94	1.1	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.34	3.8	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	9.1	2.5	0.02	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	1.2	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	1.4	3.4	0.003	0.031	4	50	200
DETSC 2055 Chloride as Cl	1800	720	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	220	< 100	0.44	0.37	10	150	500
DETSC 2055 Sulphate as SO4	9800	2800	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	66000	32000	132	377.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2900	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	5.8	6.2
DETSC 2009 Conductivity uS/cm	94.7	46.0
* Temperature*	23.0	23.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.119
Stage 1	
Volume of Leachant L2*	0.216
Volume of Eluate VE1*	0.2
Stage 2	
Volume of Leachant L8*	0.949
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04241

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1808905	TP SBC011 3 0.30	SOIL	NAD	none	Keith Wilson
1808907	BH SBC006 1 0.10	SOIL	NAD	none	Keith Wilson
1808909	TP SBC024 2 0.20	SOIL	NAD	none	Keith Wilson
1808910	TP SBC025 2 0.20	SOIL	NAD	none	Keith Wilson
1808911	BH SBC014A 1 0.20	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04241
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme D Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1808905	TP SBC011 0.30 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808906	TP SBC011 3.00 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808907	BH SBC006 0.10 SOIL	23/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808908	BH SBC006 1.00 SOIL	23/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808909	TP SBC024 0.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808910	TP SBC025 0.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808911	BH SBC014A 0.20 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808912	TP SBC011 3.00 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808913	TP SBC011 3.00 LEACHATE	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808914	BH SBC006 0.10 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1808915	BH SBC006 0.10 LEACHATE	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-03911

Issued: 15-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-03911

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme D Section 9

Description 2 Soil samples.

Date Received 24-Feb-21

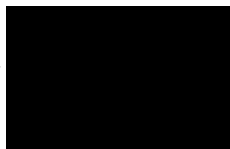
Date Started 24-Feb-21

Date Completed 15-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-03911

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC009	3	0.2	1806715	03/03/2021	Dark brown slightly gravelly, sandy CLAY including some organic matter
TP SBC007	2	0.2	1806716	03/03/2021	Dark brown slightly gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-03911

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1806715	1806716
Sample ID	TP SBC009	TP SBC007
Depth	0.20	0.20
Other ID	3	2
Sample Type	ES	ES
Sampling Date	22/02/2021	22/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	4.6	6.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.8	1.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	13	14
Chromium III	DETSC 2301*	0.15	mg/kg	13	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29	22
Lead	DETSC 2301#	0.3	mg/kg	47	44
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.09
Nickel	DETSC 2301#	1	mg/kg	8.5	10
Selenium	DETSC 2301#	0.5	mg/kg	0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	87	100
Inorganics					
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	7.5	8.3
pH	DETSC 2008#		pH	7.4	7.5
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	0.3
Total Organic Carbon	DETSC 2002	0.1	%	2.5	2.2
Organic matter	DETSC 2002#	0.1	%	4.4	3.7
Sulphide	DETSC 2024*	10	mg/kg	250	44
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	10900	3280

Summary of Chemical Analysis

Soil Samples

Our Ref 21-03911

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1806715	1806716
Sample ID	TP SBC009	TP SBC007
Depth	0.20	0.20
Other ID	3	2
Sample Type	ES	ES
Sampling Date	22/02/2021	22/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	2.1	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	4.7	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	13	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	15	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-03911

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	1806715	1806716
Sample ID	TP SBC009	TP SBC007
Depth	0.20	0.20
Other ID	3	2
Sample Type	ES	ES
Sampling Date	22/02/2021	22/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.07
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.04
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.31	0.37
Anthracene	DETSC 3303	0.03	mg/kg	0.05	0.11
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.65	0.78
Pyrene	DETSC 3303#	0.03	mg/kg	0.51	0.56
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.21	0.27
Chrysene	DETSC 3303	0.03	mg/kg	0.22	0.42
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.21	0.48
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	0.14
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.16	0.20
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.06	0.12
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.08	0.15
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.5	3.7
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.5

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-03911

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme D Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1806715	TP SBC009 3 0.20	SOIL	NAD	none	D Wilkinson
1806716	TP SBC007 2 0.20	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-03911
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme D Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1806715	TP SBC009 0.20 SOIL	22/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1806716	TP SBC007 0.20 SOIL	22/02/21	GJ 250ml x2, GJ 60ml x2, PT 500ml x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05628

Issued: 31-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05628

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Penine Scheme C Section 9

Description 2 Soil samples.

Date Received 08-Mar-21

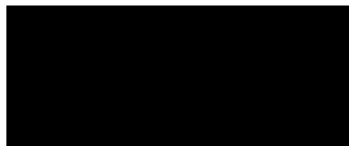
Date Started 17-Mar-21

Date Completed 31-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved



Adam Fenwick
Contracts Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 21-05628

Client Ref 4322A

Contract Title A66 North Trans Penine Scheme C Section 9

Lab No	1818287	1818288
Sample ID	BH SBC005	BH SBC008
Depth	5.00-5.45	4.50-4.95
Other ID	14	17
Sample Type	J	J
Sampling Date	25/02/2021	24/02/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Inorganics					
pH	DETSC 2008#		pH	7.8	8.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	100	140
Sulphur as S, Total	DETSC 2320	0.01	%	0.41	0.67
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1100	849

Information in Support of the Analytical Results

Our Ref 21-05628
 Client Ref 4322A
 Contract A66 North Trans Penine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1818287	BH SBC005 5.00-5.45 SOIL	25/02/21	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
1818288	BH SBC008 4.50-4.95 SOIL	24/02/21	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05582

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05582

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 2 Soil samples.

Date Received 16-Mar-21

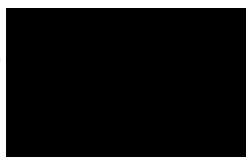
Date Started 16-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05582

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC002	1	0.2	1818024	22/03/2021	Dark brown sandy CLAY
BH SBC021	17	4	1819041	22/03/2021	Dark brown gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05582

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1818024	1819041
Sample ID	BH SBC002	BH SBC021
Depth	0.20	4.00
Other ID	1	17
Sample Type	ES	ES
Sampling Date	12/03/2021	11/03/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	6.2	7.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3
Chromium	DETSC 2301#	0.15	mg/kg	16	22
Chromium III	DETSC 2301*	0.15	mg/kg	16	22
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	16	24
Lead	DETSC 2301#	0.3	mg/kg	35	31
Mercury	DETSC 2325#	0.05	mg/kg	0.09	0.07
Nickel	DETSC 2301#	1	mg/kg	8.5	27
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	64	78
Inorganics					
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.1	3.5
pH	DETSC 2008#		pH	7.0	8.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.9	1.5
Organic matter	DETSC 2002#	0.1	%	3.4	2.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		130
Sulphide	DETSC 2024*	10	mg/kg	16	12
Sulphur as S, Total	DETSC 2320	0.01	%		0.60
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	598	679
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10

Summary of Chemical Analysis Soil Samples

Our Ref 21-05582

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1818024	1819041
Sample ID	BH SBC002	BH SBC021
Depth	0.20	4.00
Other ID	1	17
Sample Type	ES	ES
Sampling Date	12/03/2021	11/03/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.05	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.45	< 0.10
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3

Summary of Asbestos Analysis Soil Samples

Our Ref 21-05582

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1818024	BH SBC002 1 0.20	SOIL	NAD	none	Rebecca Burgess
<p>Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.</p>					

Information in Support of the Analytical Results

Our Ref 21-05582
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
1818024	BH SBC002 0.20 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1819041	BH SBC021 4.00 SOIL	11/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05425

Issued: 19-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05425

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description One Soil sample.

Date Received 02-Mar-21

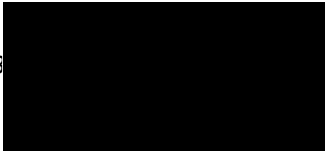
Date Started 15-Mar-21

Date Completed 19-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

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Approved By



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05425

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1817274
Sample ID	BH SBC008
Depth	1.00
Other ID	4
Sample Type	ES
Sampling Date	23/02/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
Sulphate Aqueous Extract as SO ₄	DETSC 2076#	10	mg/l	390
Sulphur as S, Total	DETSC 2320	0.01	%	0.34
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.63

Information in Support of the Analytical Results

Our Ref 21-05425
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1817274	BH SBC008 1.00 SOIL	23/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05422

Issued: 19-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05422

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description One Soil sample.

Date Received 05-Mar-21

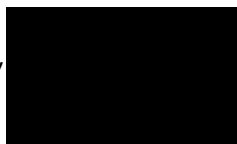
Date Started 15-Mar-21

Date Completed 19-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

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Approved By



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05422

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1817267
Sample ID	BH SBC023A
Depth	1.00
Other ID	8
Sample Type	ES
Sampling Date	02/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
Sulphate Aqueous Extract as SO ₄	DETSC 2076#	10	mg/l	20
Sulphur as S, Total	DETSC 2320	0.01	%	0.01
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.03

Information in Support of the Analytical Results

Our Ref 21-05422
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1817267	BH SBC023A 1.00 SOIL	02/03/21	GJ 250ml (250ml)		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05271

Issued: 10-May-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05271

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 4 Soil samples, 2 Leachate samples.

Date Received 10-Mar-21

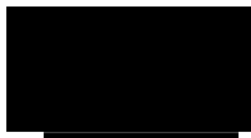
Date Started 12-Mar-21

Date Completed 10-May-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC021	3	0.2	1816298	17/03/2021	Dark brown gravelly, sandy CLAY
BH SBC024	1	0.2	1816299	17/03/2021	Brown very sandy CLAY
BH SBC024	8	2	1816300	17/03/2021	Brown gravelly, sandy CLAY
BH SBC032	1	0.5	1816301	17/03/2021	Brown very gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1816298	1816299	1816300	1816301
Sample ID	BH SBC021	BH SBC024	BH SBC024	BH SBC032
Depth	0.20	0.20	2.00	0.50
Other ID	3	1	8	1
Sample Type	ES	ES	ES	ES
Sampling Date	09/03/2021	10/03/2021	10/03/2021	10/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	3.2	4.7	6.7	5.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5	0.7	< 0.2	0.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.1	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	4.1	8.5	11	11
Chromium III	DETSC 2301*	0.15	mg/kg	4.1	8.5	11	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	15	13	21	19
Lead	DETSC 2301#	0.3	mg/kg	23	36	37	25
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	6.6	4.8	5.9	19
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	51	37	43	55
Inorganics							
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.3	5.4	4.1	5.1
pH	DETSC 2008#		pH	7.3	7.5	7.9	9.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	2.0	1.6	1.1	1.7
Organic matter	DETSC 2002#	0.1	%	3.4	2.8	1.9	3.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l			30	
Sulphide	DETSC 2024*	10	mg/kg	20	< 10	12	120
Sulphur as S, Total	DETSC 2320	0.01	%			0.03	
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	577	806	413	1690

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1816298	1816299	1816300	1816301
Sample ID	BH SBC021	BH SBC024	BH SBC024	BH SBC032
Depth	0.20	0.20	2.00	0.50
Other ID	3	1	8	1
Sample Type	ES	ES	ES	ES
Sampling Date	09/03/2021	10/03/2021	10/03/2021	10/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	71
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	53
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	110
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	1.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	8.9
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	37
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	350
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	170
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	510
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	620
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1816298	1816299	1816300	1816301
Sample ID	BH SBC021	BH SBC024	BH SBC024	BH SBC032
Depth	0.20	0.20	2.00	0.50
Other ID	3	1	8	1
Sample Type	ES	ES	ES	ES
Sampling Date	09/03/2021	10/03/2021	10/03/2021	10/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.31
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.22
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.25
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	1.5
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.32
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	< 0.03	1.4
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	0.99
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.39
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.38
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.32
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.15
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.23
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.12
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	0.12
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.13	< 0.10	6.7
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC021 3 0.20

Sample Numbers 1816298 1816302 1816303

Date Analysed 17/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.2			3	5	6
DETSC 2003# Loss On Ignition	%	6.3			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETSC2008# pH	pH Units				n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg				n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg				n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.24	< 0.16	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	6.1	1.7	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.36	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.6	0.41	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.34	0.13	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	2	< 1.3	0.004	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2000	1500	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	170	< 100	0.34	0.18	10	150	500
DETSC 2055 Sulphate as SO4	2400	1600	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	22000	7800	44	93.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	7.0	6.1
DETSC 2009 Conductivity uS/cm	31.6	11.2
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.102
Stage 1	
Volume of Leachant L2*	0.166
Volume of Eluate VE1*	0.11
Stage 2	
Volume of Leachant L8*	0.815
Volume of Eluate VE2*	0.75

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05271

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1816298	BH SBC021 3 0.20	SOIL	NAD	none	D Wilkinson
1816299	BH SBC024 1 0.20	SOIL	NAD	none	D Wilkinson
1816301	BH SBC032 1 0.50	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05271

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1816298	BH SBC021 0.20 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816299	BH SBC024 0.20 SOIL	10/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816300	BH SBC024 2.00 SOIL	10/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816301	BH SBC032 0.50 SOIL	10/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816302	BH SBC021 0.20 LEACHATE	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816303	BH SBC021 0.20 LEACHATE	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05267

Issued: 19-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05267

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 5 Soil samples, 2 Leachate samples.

Date Received 10-Mar-21

Date Started 12-Mar-21

Date Completed 19-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05267

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC026	3	0.2	1816288	19/03/2021	Dark brown gravelly, very sandy CLAY including some rootlets
BH SBC026	11	2.5	1816289	19/03/2021	Dark brown gravelly, sandy CLAY
BH SBC031	1	0.2	1816290	19/03/2021	Brown sandy CLAY
BH SBC031	11	2.5	1816291	19/03/2021	Brown sandy CLAY
TP SBC041	3	0.2	1816292	19/03/2021	Dark brown gravelly, very sandy CLAY including much rootlets

Summary of Chemical Analysis Soil Samples

Our Ref 21-05267

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1816288	1816289	1816290	1816291	1816292
.Sample ID	BH SBC026	BH SBC026	BH SBC031	BH SBC031	TP SBC041
Depth	0.20	2.50	0.20	2.50	0.20
Other ID	3	11	1	11	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	09/03/2021	09/03/2021	09/03/2021	09/03/2021	09/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	4.9	13	4.0	6.0	4.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.3	0.4	0.2	1.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.3	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	11	25	8.3	12	14
Chromium III	DETSC 2301*	0.15	mg/kg	11	25	8.3	12	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	39	62	19	25	21
Lead	DETSC 2301#	0.3	mg/kg	54	38	31	34	20
Mercury	DETSC 2325#	0.05	mg/kg	0.19	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	13	23	15	9.7	21
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	74	66	48	58	61
Inorganics								
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.6	4.2	5.4	3.8	7.9
pH	DETSC 2008#		pH	7.9	8.2	6.9	8.0	7.7
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.9	1.5	1.8	1.3	3.1
Organic matter	DETSC 2002#	0.1	%	3.2	2.6	3.0	2.2	5.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l				41	
Sulphide	DETSC 2024*	10	mg/kg	120	52	< 10	12	84
Sulphur as S, Total	DETSC 2320	0.01	%				0.02	
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1130	472	564	403	924
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	2.0	< 0.9	< 0.9	< 0.9	1.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	11	< 0.5	< 0.5	< 0.5	5.7
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	92	< 0.6	< 0.6	< 0.6	41
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	200	< 1.4	< 1.4	< 1.4	110
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10

Summary of Chemical Analysis Soil Samples

Our Ref 21-05267

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1816288	1816289	1816290	1816291	1816292
Sample ID	BH SBC026	BH SBC026	BH SBC031	BH SBC031	TP SBC041
Depth	0.20	2.50	0.20	2.50	0.20
Other ID	3	11	1	11	3
Sample Type	ES	ES	ES	ES	ES
Sampling Date	09/03/2021	09/03/2021	09/03/2021	09/03/2021	09/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	270	< 10	< 10	< 10	120
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	2.0	< 0.03	< 0.03	< 0.03	0.29
Fluorene	DETSC 3303	0.03	mg/kg	1.5	< 0.03	< 0.03	< 0.03	0.23
Phenanthrene	DETSC 3303#	0.03	mg/kg	15	0.23	< 0.03	0.09	3.2
Anthracene	DETSC 3303	0.03	mg/kg	2.4	0.03	< 0.03	< 0.03	0.40
Fluoranthene	DETSC 3303#	0.03	mg/kg	26	0.32	0.04	0.10	5.5
Pyrene	DETSC 3303#	0.03	mg/kg	20	0.25	< 0.03	0.08	4.2
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	7.8	0.10	< 0.03	< 0.03	1.3
Chrysene	DETSC 3303	0.03	mg/kg	7.9	0.11	< 0.03	< 0.03	1.5
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	7.3	0.09	< 0.03	< 0.03	1.3
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	3.3	0.03	< 0.03	< 0.03	0.50
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	5.4	0.06	< 0.03	< 0.03	0.84
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	1.9	0.05	< 0.03	< 0.03	0.39
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.67	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	2.2	0.05	< 0.03	< 0.03	0.49
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	100	1.3	< 0.10	0.26	20
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05267

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC026 3 0.20

Sample Numbers 1816288 1816293 1816294

Date Analysed 19/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	2.6
DETSC 2003# Loss On Ignition	%	5.6
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	2000.0
DETSC 3301 PAHs	mg/kg	400.0
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.43	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	35	10	0.07	0.12
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.59	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	8.3	2.1	0.017	0.026
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	3.3	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	0.55	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	1.1	0.34	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	0.18	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	5.3	1.6	0.011	0.019
DETSC 2055 Chloride as Cl	1700	630	< 20	< 100
DETSC 2055* Fluoride as F	380	< 100	0.76	0.31
DETSC 2055 Sulphate as SO4	2100	730	< 20	< 100
DETSC 2009* Total Dissolved Solids	65000	23000	130	264.1
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	3700	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	7.3	6.0
DETSC 2009 Conductivity uS/cm	92.9	32.7
* Temperature*	18.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.123

Stage 1

Volume of Leachant L2*	0.23
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.987
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

v2.06 * DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05267

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1816288	BH SBC026 3 0.20	SOIL	NAD	none	D Wilkinson
1816290	BH SBC031 1 0.20	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05267
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1816288	BH SBC026 0.20 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816289	BH SBC026 2.50 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816290	BH SBC031 0.20 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816291	BH SBC031 2.50 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816292	TP SBC041 0.20 SOIL	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816293	BH SBC026 0.20 LEACHATE	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1816294	BH SBC026 0.20 LEACHATE	09/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05075

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05075

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 3 Soil samples, 2 Leachate samples.

Date Received 10-Mar-21

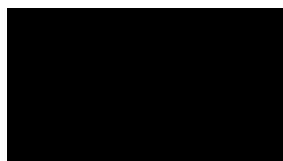
Date Started 10-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved B



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC016	1	0.3	1815079	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC013	1	0.2	1815080	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC013	4	1.2	1815081	22/03/2021	Dark brown slightly gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815079	1815080	1815081
Sample ID	BH SBC016	BH SBC013	BH SBC013
Depth	0.30	0.20	1.20
Other ID	1	1	4
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	7.3	7.7	9.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	0.6	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.4	0.4
Chromium	DETSC 2301#	0.15	mg/kg	17	15	18
Chromium III	DETSC 2301*	0.15	mg/kg	17	15	18
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	15	29	29
Lead	DETSC 2301#	0.3	mg/kg	30	48	30
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.06	< 0.05
Nickel	DETSC 2301#	1	mg/kg	16	13	38
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	72	90	80
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.5	13	6.1
pH	DETSC 2008#		pH	7.3	6.8	7.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	0.4	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.7	2.8	1.1
Organic matter	DETSC 2002#	0.1	%	2.9	4.8	1.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l			51
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10
Sulphur as S, Total	DETSC 2320	0.01	%			0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.03
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	617	953	349

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815079	1815080	1815081
Sample ID	BH SBC016	BH SBC013	BH SBC013
Depth	0.30	0.20	1.20
Other ID	1	1	4
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815079	1815080	1815081
Sample ID	BH SBC016	BH SBC013	BH SBC013
Depth	0.30	0.20	1.20
Other ID	1	1	4
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.05	0.04	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.18	< 0.10	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC013 1 0.20

Sample Numbers 1815080 1815082 1815083

Date Analysed 22/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste		
DETSC 2084# Total Organic Carbon	%	3.5	3	5	6		
DETSC 2003# Loss On Ignition	%	13.0	n/a	n/a	10		
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a		
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a		
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a		
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a		
DETSC2008# pH	pH Units		n/a	>6	n/a		
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE		
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE		

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Inert Waste	SNRHW	Hazardous Waste
	2:1	8:1	LS2	LS10			
DETSC 2306 Arsenic as As	< 0.16	0.95	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	3	4.6	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.34	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.97	1.8	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	24	32	0.05	0.31	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	0.11	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	9	< 1.3	0.018	0.012	4	50	200
DETSC 2055 Chloride as Cl	1400	880	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1400	1500	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	14000	24000	28	226.6	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	6.3	7.2
DETSC 2009 Conductivity uS/cm	19.2	34.5
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.105
Stage 1	
Volume of Leachant L2*	0.174
Volume of Eluate VE1*	0.14
Stage 2	
Volume of Leachant L8*	0.838
Volume of Eluate VE2*	0.8

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05075

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1815079	BH SBC016 1 0.30	SOIL	NAD	none	D Wilkinson
1815080	BH SBC013 1 0.20	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05075

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1815079	BH SBC016 0.30 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815080	BH SBC013 0.20 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815081	BH SBC013 1.20 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815082	BH SBC013 0.20 LEACHATE	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815083	BH SBC013 0.20 LEACHATE	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05071

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05071

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 11 Soil samples, 2 Leachate samples.

Date Received 10-Mar-21

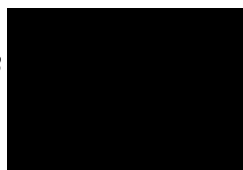
Date Started 10-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC001	1	0.2	1815058	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC018	1	0.2	1815059	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC019	1	0.2	1815060	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC020	1	0.2	1815061	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC025	5	0.2	1815062	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
BH SBC027	3	0.2	1815063	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
TP SBC036	2	0.2	1815064	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
TP SBC038	2	0.2	1815065	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
TP SBC039	2	0.2	1815066	22/03/2021	Dark brown slightly gravelly, sandy CLAY including odd rootlets
TP SBC040	2	0.2	1815067	22/03/2021	Dark brown slightly gravelly, sandy CLAY
TP SBC044	2	0.3	1815068	22/03/2021	Dark brown slightly gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815058	1815059	1815060	1815061
Sample ID	BH SBC001	BH SBC018	BH SBC019	BH SBC020
Depth	0.20	0.20	0.20	0.20
Other ID	1	1	1	1
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	07/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	8.3	5.9	3.4	6.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	0.8	0.4	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.8	0.4	0.4	0.2
Chromium	DETSC 2301#	0.15	mg/kg	13	14	16	16
Chromium III	DETSC 2301*	0.15	mg/kg	13	14	16	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	23	19	8.6	27
Lead	DETSC 2301#	0.3	mg/kg	46	41	34	40
Mercury	DETSC 2325#	0.05	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	20	9.0	11	5.9
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	93	53	60	48
Inorganics							
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.1	7.6	5.4	5.6
pH	DETSC 2008#		pH	7.5	7.2	7.1	7.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	0.3	0.2	0.3
Total Organic Carbon	DETSC 2002	0.1	%	1.9	2.6	0.8	1.5
Organic matter	DETSC 2002#	0.1	%	3.3	4.5	1.4	2.6
Sulphide	DETSC 2024*	10	mg/kg	12	24	20	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	813	770	635	598

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815058	1815059	1815060	1815061
Sample ID	BH SBC001	BH SBC018	BH SBC019	BH SBC020
Depth	0.20	0.20	0.20	0.20
Other ID	1	1	1	1
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	07/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1815058	1815059	1815060	1815061
Sample ID	BH SBC001	BH SBC018	BH SBC019	BH SBC020
Depth	0.20	0.20	0.20	0.20
Other ID	1	1	1	1
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	07/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	0.4	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815062	1815063	1815064	1815065
Sample ID	BH SBC025	BH SBC027	TP SBC036	TP SBC038
Depth	0.20	0.20	0.20	0.20
Other ID	5	3	2	2
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	05/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	7.2	6.4	8.2	5.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.7	0.5	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.5	0.3	0.4
Chromium	DETSC 2301#	0.15	mg/kg	13	15	17	11
Chromium III	DETSC 2301*	0.15	mg/kg	13	15	17	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	23	26	31	18
Lead	DETSC 2301#	0.3	mg/kg	42	51	42	43
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.06	< 0.05
Nickel	DETSC 2301#	1	mg/kg	10	13	13	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	49	69	75	61
Inorganics							
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.9	6.5	5.5	7.2
pH	DETSC 2008#		pH	6.4	6.6	6.6	6.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	0.3	0.3	0.3
Total Organic Carbon	DETSC 2002	0.1	%	1.2	1.8	1.6	1.9
Organic matter	DETSC 2002#	0.1	%	2.0	3.1	2.8	3.3
Sulphide	DETSC 2024*	10	mg/kg	16	< 10	< 10	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	454	765	589	677

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815062	1815063	1815064	1815065
Sample ID	BH SBC025	BH SBC027	TP SBC036	TP SBC038
Depth	0.20	0.20	0.20	0.20
Other ID	5	3	2	2
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	05/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815062	1815063	1815064	1815065
Sample ID	BH SBC025	BH SBC027	TP SBC036	TP SBC038
Depth	0.20	0.20	0.20	0.20
Other ID	5	3	2	2
Sample Type	ES	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	05/03/2021	05/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	< 0.03	0.04
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.15	< 0.10	< 0.10
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815066	1815067	1815068
Sample ID	TP SBC039	TP SBC040	TP SBC044
Depth	0.20	0.20	0.30
Other ID	2	2	2
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	7.4	6.7	6.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.9	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.5	0.6
Chromium	DETSC 2301#	0.15	mg/kg	16	13	17
Chromium III	DETSC 2301*	0.15	mg/kg	16	13	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	26	23	22
Lead	DETSC 2301#	0.3	mg/kg	40	34	39
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.3	14	15
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	71	66	72
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.9	5.9	6.3
pH	DETSC 2008#		pH	6.7	7.1	7.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	0.2	0.3
Total Organic Carbon	DETSC 2002	0.1	%	1.6	1.8	1.6
Organic matter	DETSC 2002#	0.1	%	2.8	3.2	2.8
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	607	640	680

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815066	1815067	1815068
Sample ID	TP SBC039	TP SBC040	TP SBC044
Depth	0.20	0.20	0.30
Other ID	2	2	2
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1815066	1815067	1815068
Sample ID	TP SBC039	TP SBC040	TP SBC044
Depth	0.20	0.20	0.30
Other ID	2	2	2
Sample Type	ES	ES	ES
Sampling Date	05/03/2021	08/03/2021	08/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1815058 1815069 1815070

Sample Id BH SBC001 1 0.20

Date Analysed 17/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	2.1
DETSC 2003# Loss On Ignition	%	6.1
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	1.2	< 0.002	0.011
DETSC 2306 Barium as Ba	4.6	5	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.49	1	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	29	32	0.06	0.32
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	0.16	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	0.74	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	2000	780	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	1600	1300	< 20	< 100
DETSC 2009* Total Dissolved Solids	33000	17000	66	189.9
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	5800	< 2000	11.6	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.1	6.4
DETSC 2009 Conductivity uS/cm	47.1	23.6
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.112

Stage 1

Volume of Leachant L2*	0.197
Volume of Eluate VE1*	0.14

Stage 2

Volume of Leachant L8*	0.9
Volume of Eluate VE2*	0.84

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05071

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1815058	BH SBC001 1 0.20	SOIL	NAD	none	D Wilkinson
1815059	BH SBC018 1 0.20	SOIL	NAD	none	D Wilkinson
1815060	BH SBC019 1 0.20	SOIL	NAD	none	D Wilkinson
1815061	BH SBC020 1 0.20	SOIL	NAD	none	D Wilkinson
1815062	BH SBC025 5 0.20	SOIL	NAD	none	D Wilkinson
1815063	BH SBC027 3 0.20	SOIL	NAD	none	D Wilkinson
1815064	TP SBC036 2 0.20	SOIL	NAD	none	D Wilkinson
1815065	TP SBC038 2 0.20	SOIL	NAD	none	D Wilkinson
1815066	TP SBC039 2 0.20	SOIL	NAD	none	D Wilkinson
1815067	TP SBC040 2 0.20	SOIL	NAD	none	D Wilkinson
1815068	TP SBC044 2 0.30	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05071
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1815058	BH SBC001 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815059	BH SBC018 0.20 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815060	BH SBC019 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815061	BH SBC020 0.20 SOIL	07/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815062	BH SBC025 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815063	BH SBC027 0.20 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815064	TP SBC036 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815065	TP SBC038 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815066	TP SBC039 0.20 SOIL	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815067	TP SBC040 0.20 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815068	TP SBC044 0.30 SOIL	08/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815069	BH SBC001 0.20 LEACHATE	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1815070	BH SBC001 0.20 LEACHATE	05/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04815

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04815

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 5 Soil samples, 8 Leachate samples.

Date Received 08-Mar-21

Date Started 08-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC022	2	0.2	1813513	22/03/2021	Dark brown gravelly, sandy CLAY
TP SBC035	3	0.4	1813514	22/03/2021	Dark brown sandy CLAY
BH SBC017	1	0.2	1813515	22/03/2021	Dark brown very sandy CLAY
BH SBC030	1	0.2	1813516	22/03/2021	Dark brown very sandy CLAY
BH SBC030	5	1	1813517	22/03/2021	Dark brown sandy CLAY

Summary of Chemical Analysis Soil Samples

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1813513	1813514	1813515	1813516	1813517
Sample ID	TP SBC022	TP SBC035	BH SBC017	BH SBC030	BH SBC030
Depth	0.20	0.40	0.20	0.20	1.00
Other ID	2	3	1	1	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	7.0	3.7	6.6	7.9	7.0
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7	0.2	0.8	0.6	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.3	0.4	0.2	0.5
Chromium	DETSC 2301#	0.15	mg/kg	16	16	16	17	17
Chromium III	DETSC 2301*	0.15	mg/kg	16	16	16	17	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	18	13	24	33	27
Lead	DETSC 2301#	0.3	mg/kg	32	26	48	43	27
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	14	12	11	10	38
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	74	64	81	69	75
Inorganics								
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.3	4.1	10	7.2	4.4
pH	DETSC 2008#		pH	7.2	7.1	7.1	7.3	7.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.5	0.6	2.9	1.6	0.4
Organic matter	DETSC 2002#	0.1	%	2.6	1.0	5.0	2.8	0.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l					33
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	< 10	180
Sulphur as S, Total	DETSC 2320	0.01	%					0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%					0.03
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	757	554	1140	709	301

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1813513	1813514	1813515	1813516	1813517
Sample ID	TP SBC022	TP SBC035	BH SBC017	BH SBC030	BH SBC030
Depth	0.20	0.40	0.20	0.20	1.00
Other ID	2	3	1	1	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETS 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETS 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETS 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETS 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETS 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETS 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETS 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETS 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETS 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETS 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Benzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs								
Naphthalene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Anthracene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	0.07	< 0.03	< 0.03
Pyrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	0.06	< 0.03	< 0.03
Benzo(a)anthracene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03



Summary of Chemical Analysis

Soil Samples

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1813513	1813514	1813515	1813516	1813517
Sample ID	TP SBC022	TP SBC035	BH SBC017	BH SBC030	BH SBC030
Depth	0.20	0.40	0.20	0.20	1.00
Other ID	2	3	1	1	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	04/03/2021	04/03/2021	04/03/2021	04/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	0.21	< 0.10	< 0.10
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1813513 1813518 1813519

Sample Id TP SBC022 2 0.20

Date Analysed 15/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.1	3	5	6
DETSC 2003# Loss On Ignition	%	6.3	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.23	0.25	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	10	9.7	0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.39	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.49	< 0.40	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.33	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2000	950	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	2700	1200	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	18000	8200	36	91	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.8	6.6
DETSC 2009 Conductivity uS/cm	25.5	11.7
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.109

Stage 1

Volume of Leachant L2*	0.187
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.871
Volume of Eluate VE2*	0.8

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC035 3 0.40

Sample Numbers 1813514 1813520 1813521

Date Analysed 15/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	0.7	3	5	6
DETSC 2003# Loss On Ignition	%	4.1	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	10	9.8	0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.71	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	< 0.40	< 0.40	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	3100	1300	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	7000	5300	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	21000	13000	42	136.9	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.0	6.0
DETSC 2009 Conductivity uS/cm	29.3	17.9
* Temperature*	20.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.116

Stage 1

Volume of Leachant L2*	0.207
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.925
Volume of Eluate VE2*	0.84

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC017 1 0.20

Sample Numbers 1813515 1813522 1813523

Date Analysed 15/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	3.2	3	5	6
DETSC 2003# Loss On Ignition	%	10.0	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	0.29	0.2	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	12	10	0.02	0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.91	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3	0.44	0.006	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.49	0.16	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	4300	1200	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	430	< 100	0.86	0.43	10	150	500
DETSC 2055 Sulphate as SO4	3900	1300	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	41000	7100	82	104.7	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	2700	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.2	6.4
DETSC 2009 Conductivity uS/cm	58.0	10.1
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.101

Stage 1

Volume of Leachant L2*	0.162
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.806
Volume of Eluate VE2*	0.74

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC030 1 0.20

Sample Numbers 1813516 1813524 1813525

Date Analysed 15/03/2021

Test Results On Waste			WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	2.0	3	5	6
DETSC 2003# Loss On Ignition	%	7.2	n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a
DETSC2008# pH	pH Units		n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg		n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg		n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
	DETSC 2306 Arsenic as As	< 0.16	0.18	< 0.002	< 0.01	0.5	2
DETSC 2306 Barium as Ba	9.9	9.7	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.41	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.61	< 0.40	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	2000	940	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	130	< 100	0.26	0.12	10	150	500
DETSC 2055 Sulphate as SO4	2400	1100	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	15000	< 5000	30	< 50	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information

DETSC 2008 pH	6.2	6.3
DETSC 2009 Conductivity uS/cm	22.1	7.1
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.108

Stage 1

Volume of Leachant L2*	0.185
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.867
Volume of Eluate VE2*	0.81

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

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Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04815

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1813513	TP SBC022 2 0.20	SOIL	NAD	none	Keith Wilson
1813514	TP SBC035 3 0.40	SOIL	NAD	none	Keith Wilson
1813515	BH SBC017 1 0.20	SOIL	NAD	none	Keith Wilson
1813516	BH SBC030 1 0.20	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04815
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1813513	TP SBC022 0.20 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813514	TP SBC035 0.40 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813515	BH SBC017 0.20 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813516	BH SBC030 0.20 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813517	BH SBC030 1.00 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813518	TP SBC022 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813519	TP SBC022 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813520	TP SBC035 0.40 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813521	TP SBC035 0.40 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813522	BH SBC017 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813523	BH SBC017 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813524	BH SBC030 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813525	BH SBC030 0.20 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04811

Issued: 25-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04811

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 7 Soil samples, 2 Leachate samples.

Date Received 08-Mar-21

Date Started 08-Mar-21

Date Completed 25-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
TP SBC013	2	0.2	1813467	17/03/2021	Brown very sandy, gravelly CLAY
TP SBC013	13	4	1813468	17/03/2021	Dark brown gravelly, sandy CLAY
TP SBC015	2	0.2	1813469	17/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC023	2	0.2	1813470	17/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
BH SBC029	4	1	1813471	17/03/2021	Brown gravelly, sandy CLAY
TP SBC030	3	0.4	1813472	17/03/2021	Brown gravelly, sandy CLAY
TP SBC042	3	0.3	1813473	17/03/2021	Brown gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1813467	1813468	1813469	1813470	1813471	1813472
Sample ID	TP SBC013	TP SBC013	TP SBC015	TP SBC023	BH SBC029	TP SBC030
Depth	0.20	4.00	0.20	0.20	1.00	0.40
Other ID	2	13	2	2	4	3
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	03/03/2021	03/03/2021	03/03/2021	03/03/2021	03/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	9.1	7.2	6.3	7.5	8.2	8.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.3	0.5	0.7	< 0.2	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.6	0.4	0.7	0.4	0.2
Chromium	DETSC 2301#	0.15	mg/kg	20	12	12	13	19	12
Chromium III	DETSC 2301*	0.15	mg/kg	20	12	12	13	19	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	26	22	22	17	26	11
Lead	DETSC 2301#	0.3	mg/kg	50	19	37	42	33	25
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	18	23	11	13	32	8.0
Selenium	DETSC 2301#	0.5	mg/kg	0.9	< 0.5	< 0.5	0.6	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	94	120	76	82	71	40
Inorganics									
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.6	4.3	6.4	6.6	3.0	3.7
pH	DETSC 2008#		pH	6.4	8.1	6.8	7.4	7.9	7.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	< 0.1	0.2	0.2	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.7	2.3	2.3	2.4	0.3	0.8
Organic matter	DETSC 2002#	0.1	%	2.9	4.0	3.9	4.1	0.5	1.4
Sulphide	DETSC 2024*	10	mg/kg	< 10	44	< 10	< 10	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1010	1350	882	969	245	427
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10



Summary of Chemical Analysis

Soil Samples

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1813467	1813468	1813469	1813470	1813471	1813472
Sample ID	TP SBC013	TP SBC013	TP SBC015	TP SBC023	BH SBC029	TP SBC030
Depth	0.20	4.00	0.20	0.20	1.00	0.40
Other ID	2	13	2	2	4	3
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	03/03/2021	03/03/2021	03/03/2021	03/03/2021	03/03/2021	04/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1813473
Sample ID	TP SBC042
Depth	0.30
Other ID	3
Sample Type	ES
Sampling Date	03/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	6.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.3
Chromium	DETSC 2301#	0.15	mg/kg	14
Chromium III	DETSC 2301*	0.15	mg/kg	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	19
Lead	DETSC 2301#	0.3	mg/kg	33
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05
Nickel	DETSC 2301#	1	mg/kg	12
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Zinc	DETSC 2301#	1	mg/kg	65
Inorganics				
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.7
pH	DETSC 2008#		pH	7.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.3
Organic matter	DETSC 2002#	0.1	%	2.2
Sulphide	DETSC 2024*	10	mg/kg	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	480
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1813473
Sample ID	TP SBC042
Depth	0.30
Other ID	3
Sample Type	ES
Sampling Date	03/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Numbers 1813472 1813474 1813475

Sample Id TP SBC030 3 0.40

Date Analysed 17/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.7
DETSC 2003# Loss On Ignition	%	3.7
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.79	0.61	< 0.002	< 0.01
DETSC 2306 Barium as Ba	11	10	0.02	0.1
DETSC 2306 Cadmium as Cd	0.034	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	1.1	0.28	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.89	0.44	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	0.024	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	2.4	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.75	0.45	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	0.18	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	1.6	0.59	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	1800	1300	< 20	< 100
DETSC 2055* Fluoride as F	170	< 100	0.34	0.15
DETSC 2055 Sulphate as SO4	4300	2600	< 20	< 100
DETSC 2009* Total Dissolved Solids	18000	12000	36	125.2
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.5	6.4
DETSC 2009 Conductivity uS/cm	25.5	16.6
* Temperature*	18.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.114

Stage 1

Volume of Leachant L2*	0.203
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.915
Volume of Eluate VE2*	0.84

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04811

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1813467	TP SBC013 2 0.20	SOIL	NAD	none	Steven Lambert
1813469	TP SBC015 2 0.20	SOIL	NAD	none	Steven Lambert
1813470	TP SBC023 2 0.20	SOIL	NAD	none	Steven Lambert
1813472	TP SBC030 3 0.40	SOIL	NAD	none	Steven Lambert
1813473	TP SBC042 3 0.30	SOIL	NAD	none	Steven Lambert

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04811
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1813467	TP SBC013 0.20 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813468	TP SBC013 4.00 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813469	TP SBC015 0.20 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813470	TP SBC023 0.20 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813471	BH SBC029 1.00 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813472	TP SBC030 0.40 SOIL	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813473	TP SBC042 0.30 SOIL	03/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813474	TP SBC030 0.40 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1813475	TP SBC030 0.40 LEACHATE	04/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



Certificate of Analysis

Certificate Number 21-04695

Issued: 12-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04695

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 5 Soil samples, 2 Leachate samples.

Date Received 05-Mar-21

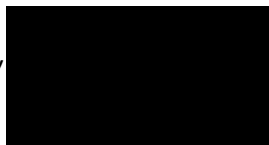
Date Started 05-Mar-21

Date Completed 12-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04695

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC028	1	0.2	1812736	12/03/2021	Dark brown sandy CLAY
TP SBC019	3	0.3	1812737	12/03/2021	Brown sandy CLAY
TP SBC020	3	0.3	1812738	12/03/2021	Brown sandy CLAY
TP SBC021	3	0.3	1812739	12/03/2021	Brown sandy CLAY
BH SBC023A	8	1	1812740	12/03/2021	Brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04695

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1812736	1812737	1812738	1812739	1812740
Sample ID	BH SBC028	TP SBC019	TP SBC020	TP SBC021	BH SBC023A
Depth	0.20	0.30	0.30	0.30	1.00
Other ID	1	3	3	3	8
Sample Type	ES	ES	ES	ES	ES
Sampling Date	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1812736	1812737	1812738	1812739	1812740
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	7.7	7.0	6.9	7.3	6.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5	0.2	0.3	< 0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.1	0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	13	13	15	18	14
Chromium III	DETSC 2301*	0.15	mg/kg	13	13	15	18	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	14	20	31	24
Lead	DETSC 2301#	0.3	mg/kg	43	22	36	32	43
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	6.8	17	10	12	42
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	49	65	42	50	74
Inorganics								
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.9	4.1	5.1	5.5	4.7
pH	DETSC 2008#		pH	7.2	7.6	7.6	7.8	7.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	< 0.1	0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.3	0.7	0.7	0.6	0.9
Organic matter	DETSC 2002#	0.1	%	2.3	1.2	1.2	1.1	1.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	12	20	24
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	551	391	453	322	281
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 21-04695

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1812736	1812737	1812738	1812739	1812740
Sample ID	BH SBC028	TP SBC019	TP SBC020	TP SBC021	BH SBC023A
Depth	0.20	0.30	0.30	0.30	1.00
Other ID	1	3	3	3	8
Sample Type	ES	ES	ES	ES	ES
Sampling Date	02/03/2021	02/03/2021	02/03/2021	02/03/2021	02/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04695

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC021 3 0.30

Sample Numbers 1812739 1812741 1812742

Date Analysed 12/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.9
DETSC 2003# Loss On Ignition	%	5.5
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.29	0.17	< 0.002	< 0.01
DETSC 2306 Barium as Ba	0.94	0.68	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.42	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.59	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.35	0.23	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	2.7	1.6	0.005	0.017
DETSC 2055 Chloride as Cl	860	720	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	910	860	< 20	< 100
DETSC 2009* Total Dissolved Solids	8500	6500	17	67.6
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information		
DETSC 2008 pH	5.9	6.9
DETSC 2009 Conductivity uS/cm	12.2	9.3
* Temperature*	20.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.114

Stage 1	
Volume of Leachant L2*	0.201
Volume of Eluate VE1*	0.15

Stage 2	
Volume of Leachant L8*	0.911
Volume of Eluate VE2*	0.88

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis Soil Samples

Our Ref 21-04695

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1812736	BH SBC028 1 0.20	SOIL	NAD	none	Keith Wilson
1812737	TP SBC019 3 0.30	SOIL	NAD	none	Keith Wilson
1812738	TP SBC020 3 0.30	SOIL	NAD	none	Keith Wilson
1812739	TP SBC021 3 0.30	SOIL	NAD	none	Keith Wilson
1812740	BH SBC023A 8 1.00	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04695

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
1812736	BH SBC028 0.20 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812737	TP SBC019 0.30 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812738	TP SBC020 0.30 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812739	TP SBC021 0.30 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812740	BH SBC023A 1.00 SOIL	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812741	TP SBC021 0.30 LEACHATE	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1812742	TP SBC021 0.30 LEACHATE	02/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04476

Issued: 15-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04476

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 7 Soil samples, 8 Leachate samples.

Date Received 02-Mar-21

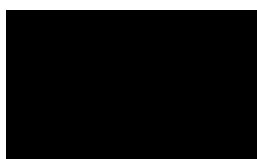
Date Started 03-Mar-21

Date Completed 15-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC005	1	0.2	1810739	10/03/2021	Dark brown gravelly, sandy CLAY
BH SBC007	1	0.2	1810740	10/03/2021	Dark brown gravelly, sandy CLAY
TP SBC001	2	0.2	1810741	10/03/2021	Dark brown gravelly, sandy CLAY including odd rootlets
TP SBC017	3	0.4	1810742	10/03/2021	Brown gravelly, sandy CLAY
TP SBC017	8	1.2	1810743	10/03/2021	Dark grey slightly gravelly, sandy CLAY
TP SBC018	10	2.2	1810744	10/03/2021	Dark grey sandy CLAY
TP SBC034	2	0.2	1810745	10/03/2021	Dark brown slightly gravelly, sandy CLAY including odd

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810739	1810740	1810741	1810742
Sample ID	BH SBC005	BH SBC007	TP SBC001	TP SBC017
Depth	0.20	0.20	0.20	0.40
Other ID	1	1	2	3
Sample Type	ES	ES	ES	ES
Sampling Date	25/02/2021	01/03/2021	02/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	9.8	7.7	5.7	4.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.8	0.4	0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.4	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	16	15	12	11
Chromium III	DETSC 2301*	0.15	mg/kg	16	15	12	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29	19	20	15
Lead	DETSC 2301#	0.3	mg/kg	40	37	27	12
Mercury	DETSC 2325#	0.05	mg/kg	0.10	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	12	8.2	17	15
Selenium	DETSC 2301#	0.5	mg/kg	1.5	1.1	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	94	79	77	47
Inorganics							
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	5.5	6.2	4.6	2.1
pH	DETSC 2008#		pH	7.1	7.2	6.5	7.9
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	0.3	0.3	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.3	1.6	0.8	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.3	2.8	1.3	< 0.1
Sulphide	DETSC 2024*	10	mg/kg	36	40	24	16
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	596	686	423	250

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810739	1810740	1810741	1810742
Sample ID	BH SBC005	BH SBC007	TP SBC001	TP SBC017
Depth	0.20	0.20	0.20	0.40
Other ID	1	1	2	3
Sample Type	ES	ES	ES	ES
Sampling Date	25/02/2021	01/03/2021	02/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810739	1810740	1810741	1810742
Sample ID	BH SBC005	BH SBC007	TP SBC001	TP SBC017
Depth	0.20	0.20	0.20	0.40
Other ID	1	1	2	3
Sample Type	ES	ES	ES	ES
Sampling Date	25/02/2021	01/03/2021	02/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.04	0.05	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.05	0.09	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.04	0.06	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.12	0.23	< 0.10	< 0.10
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1810743	1810744	1810745
Sample ID	TP SBC017	TP SBC018	TP SBC034
Depth	1.20	2.20	0.20
Other ID	8	10	2
Sample Type	ES	ES	ES
Sampling Date	01/03/2021	01/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	6.2	8.7	6.5
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	0.4	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.5
Chromium	DETSC 2301#	0.15	mg/kg	14	15	15
Chromium III	DETSC 2301*	0.15	mg/kg	14	15	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24	26	68
Lead	DETSC 2301#	0.3	mg/kg	18	25	46
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	27	28	10
Selenium	DETSC 2301#	0.5	mg/kg	0.6	< 0.5	0.6
Zinc	DETSC 2301#	1	mg/kg	81	75	75
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.6	5.0	8.3
pH	DETSC 2008#		pH	8.1	8.0	7.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.1
Total Organic Carbon	DETSC 2002	0.1	%	5.4	0.7	2.5
Organic matter	DETSC 2002#	0.1	%	9.3	1.1	4.3
Sulphide	DETSC 2024*	10	mg/kg	< 10	12	16
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	617	281	716

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1810743	1810744	1810745
Sample ID	TP SBC017	TP SBC018	TP SBC034
Depth	1.20	2.20	0.20
Other ID	8	10	2
Sample Type	ES	ES	ES
Sampling Date	01/03/2021	01/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 1

Lab No	1810743	1810744	1810745
Sample ID	TP SBC017	TP SBC018	TP SBC034
Depth	1.20	2.20	0.20
Other ID	8	10	2
Sample Type	ES	ES	ES
Sampling Date	01/03/2021	01/03/2021	01/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.04
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC005 1 0.20

Sample Numbers 1810739 1810746 1810747

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.8
DETSC 2003# Loss On Ignition	%	5.5
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.33	1.1	< 0.002	0.01
DETSC 2306 Barium as Ba	2.6	2.9	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	0.058	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.52	0.33	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.68	0.74	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	0.017	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	2.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	0.66	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.38	0.25	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	0.23	0.37	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.86	0.33	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	4.1	2.9	0.008	0.03
DETSC 2055 Chloride as Cl	650	690	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	660	1100	< 20	< 100
DETSC 2009* Total Dissolved Solids	6000	12000	12	114.7
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.7	6.2
DETSC 2009 Conductivity uS/cm	8.6	16.5
* Temperature*	21.0	20.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.113

Stage 1

Volume of Leachant L2*	0.199
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.905
Volume of Eluate VE2*	0.84

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC001 2 0.20

Sample Numbers 1810741 1810748 1810749

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.2
DETSC 2003# Loss On Ignition	%	4.6
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.24	1.8	< 0.002	0.017
DETSC 2306 Barium as Ba	1.4	9.5	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.4	0.43	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.68	1.4	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.21	0.89	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	0.82	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	0.27	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	4.9	3.7	0.01	0.038
DETSC 2055 Chloride as Cl	660	790	< 20	< 100
DETSC 2055* Fluoride as F	110	< 100	0.22	< 0.1
DETSC 2055 Sulphate as SO4	680	1800	< 20	< 100
DETSC 2009* Total Dissolved Solids	8700	15000	17.4	144.4
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.1	6.3
DETSC 2009 Conductivity uS/cm	12.5	20.8
* Temperature*	19.0	19.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.113

Stage 1

Volume of Leachant L2*	0.198
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.901
Volume of Eluate VE2*	0.84

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC017 3 0.40

Sample Numbers 1810742 1810750 1810751

Date Analysed 10/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	< 0.5
DETSC 2003# Loss On Ignition	%	2.1
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.21	1.2	< 0.002	0.011
DETSC 2306 Barium as Ba	5.4	4.8	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.27	0.31	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.52	0.98	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.19	0.27	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	0.46	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	2.3	3.3	0.005	0.032
DETSC 2055 Chloride as Cl	1700	740	< 20	< 100
DETSC 2055* Fluoride as F	150	< 100	0.3	0.12
DETSC 2055 Sulphate as SO4	2700	1700	< 20	< 100
DETSC 2009* Total Dissolved Solids	22000	14000	44	146.5
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	5.7	6.3
DETSC 2009 Conductivity uS/cm	31.9	20.2
* Temperature*	19.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.122

Stage 1

Volume of Leachant L2*	0.227
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.978
Volume of Eluate VE2*	0.92

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC018 10 2.20

Sample Numbers 1810744 1810752 1810753

Date Analysed 10/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.8			3	5	6
DETSC 2003# Loss On Ignition	%	5.0			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETSC2008# pH	pH Units				n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg				n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg				n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	< 0.16	1.4	< 0.002	0.013	0.5	2	25
DETSC 2306 Barium as Ba	4.1	8.3	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	< 0.25	0.29	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.48	1	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	0.42	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	5.9	< 1.3	0.012	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	770	880	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	740	2500	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	15000	28000	30	269.2	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	5.8	7.5
DETSC 2009 Conductivity uS/cm	21.9	39.4
* Temperature*	20.0	18.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.120
Stage 1	
Volume of Leachant L2*	0.221
Volume of Eluate VE1*	0.1
Stage 2	
Volume of Leachant L8*	0.961
Volume of Eluate VE2*	0.904

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04476

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1810739	BH SBC005 1 0.20	SOIL	NAD	none	Lee Kerridge
1810740	BH SBC007 1 0.20	SOIL	NAD	none	Lee Kerridge
1810741	TP SBC001 2 0.20	SOIL	NAD	none	Lee Kerridge
1810742	TP SBC017 3 0.40	SOIL	NAD	none	Lee Kerridge
1810745	TP SBC034 2 0.20	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04476

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1810739	BH SBC005 0.20 SOIL	25/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810740	BH SBC007 0.20 SOIL	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810741	TP SBC001 0.20 SOIL	02/03/21	GJ 60ml x2, PT 1L x3		
1810742	TP SBC017 0.40 SOIL	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810743	TP SBC017 1.20 SOIL	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810744	TP SBC018 2.20 SOIL	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810745	TP SBC034 0.20 SOIL	01/03/21	GJ 60ml x2, PT 1L x3		
1810746	BH SBC005 0.20 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810747	BH SBC005 0.20 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810748	TP SBC001 0.20 LEACHATE	01/03/21	GJ 60ml x2, PT 1L x3		
1810749	TP SBC001 0.20 LEACHATE	01/03/21	GJ 60ml x2, PT 1L x3		
1810750	TP SBC017 0.40 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810751	TP SBC017 0.40 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810752	TP SBC018 2.20 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810753	TP SBC018 2.20 LEACHATE	01/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04426-1

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04426-1

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 12 Soil samples, 8 Leachate samples.

Date Received 02-Mar-21

Date Started 03-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 21-04426, extra testing added.**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approve



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC012	3	0.2	1810519	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
BH SBC012	16	2.4	1810520	22/03/2021	Dark brown gravelly, sandy CLAY
BH SBC015	1	0.2	1810521	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
BH SBC015	6	2.2	1810522	22/03/2021	Dark brown gravelly, very sandy CLAY
TP SBC002	5	1	1810523	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC003	2	0.2	1810524	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC004	2	0.2	1810525	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC031	3	0.3	1810526	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC031	10	2.2	1810527	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC032	2	0.3	1810528	22/03/2021	Dark brown gravelly, sandy CLAY including some rootlets
TP SBC032	8	1.2	1810529	22/03/2021	Dark brown gravelly, sandy CLAY
TP SBC033	3	0.3	1810530	22/03/2021	Dark brown gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810519	1810520	1810521	1810522	1810523	1810524
Sample ID	BH SBC012	BH SBC012	BH SBC015	BH SBC015	TP SBC002	TP SBC003
Depth	0.20	2.40	0.20	2.20	1.00	0.20
Other ID	3	16	1	6	5	2
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	25/03/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	1810519	1810520	1810521	1810522	1810523	1810524
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	8.6	9.9	12	8.3	8.1	5.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	1.1	0.8	0.4	0.3	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.2	0.5	0.3	0.5	0.3
Chromium	DETSC 2301#	0.15	mg/kg	14	21	20	14	15	11
Chromium III	DETSC 2301*	0.15	mg/kg	14	21	20	14	15	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	23	29	35	27	24	13
Lead	DETSC 2301#	0.3	mg/kg	58	26	36	22	23	31
Mercury	DETSC 2325#	0.05	mg/kg	0.05	< 0.05	0.07	< 0.05	0.07	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.2	33	31	25	38	7.7
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5	0.9	< 0.5
Zinc	DETSC 2301#	1	mg/kg	94	100	77	68	92	50
Inorganics									
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	11	6.4	5.7	4.0	4.4	6.0
pH	DETSC 2008#		pH	6.7	7.7	6.4	8.1	7.3	8.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	0.1	< 0.1	< 0.1	0.1
Total Organic Carbon	DETSC 2002	0.1	%	3.3	1.2	1.7	1.3	0.5	1.8
Organic matter	DETSC 2002#	0.1	%	5.8	2.0	3.0	2.2	0.9	3.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		1600		180		
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	12	16	< 10	< 10
Sulphur as S, Total	DETSC 2320	0.01	%		0.34		0.33		
Sulphate as SO4, Total	DETSC 2321#	0.01	%		0.86		0.08		
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	12600	8580	856	810	398	819

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810519	1810520	1810521	1810522	1810523	1810524
Sample ID	BH SBC012	BH SBC012	BH SBC015	BH SBC015	TP SBC002	TP SBC003
Depth	0.20	2.40	0.20	2.20	1.00	0.20
Other ID	3	16	1	6	5	2
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	25/03/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.09	< 0.03	0.09	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.17	< 0.03	0.15	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.13	< 0.03	0.11	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	0.03	0.04	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.07	0.03	0.05	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.04	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810519	1810520	1810521	1810522	1810523	1810524
Sample ID	BH SBC012	BH SBC012	BH SBC015	BH SBC015	TP SBC002	TP SBC003
Depth	0.20	2.40	0.20	2.20	1.00	0.20
Other ID	3	16	1	6	5	2
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	25/03/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.55	< 0.10	0.48	< 0.10	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04426-1

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Lab No	1810525	1810526	1810527	1810528	1810529	1810530
Sample ID	TP SBC004	TP SBC031	TP SBC031	TP SBC032	TP SBC032	TP SBC033
Depth	0.20	0.30	2.20	0.30	1.20	0.30
Other ID	2	3	10	2	8	3
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	5.9	5.3	5.8	6.8	5.7	6.2
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.2	0.6	< 0.2	0.3	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.1	0.2	0.3	0.4	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	14	15	12	12	10	13
Chromium III	DETSC 2301*	0.15	mg/kg	14	15	12	12	10	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	16	16	20	21	20	11
Lead	DETSC 2301#	0.3	mg/kg	33	27	20	20	23	21
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	7.8	13	21	23	20	7.3
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	50	51	54	63	63	35
Inorganics									
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.8	4.7	4.3	5.4	3.4	2.8
pH	DETSC 2008#		pH	7.7	7.7	8.2	7.0	7.9	6.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	2.1	0.8	1.0	1.6	0.5	0.1
Organic matter	DETSC 2002#	0.1	%	3.6	1.3	1.7	2.7	0.8	0.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l						
Sulphide	DETSC 2024*	10	mg/kg	12	16	20	16	20	24
Sulphur as S, Total	DETSC 2320	0.01	%						
Sulphate as SO4, Total	DETSC 2321#	0.01	%						
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	790	308	373	703	372	320

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810525	1810526	1810527	1810528	1810529	1810530
Sample ID	TP SBC004	TP SBC031	TP SBC031	TP SBC032	TP SBC032	TP SBC033
Depth	0.20	0.30	2.20	0.30	1.20	0.30
Other ID	2	3	10	2	8	3
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.33	0.06	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	0.07	< 0.03	< 0.03	0.04	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.4	0.09	< 0.03	0.05	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	1.1	0.06	< 0.03	0.04	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.39	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.45	0.04	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.45	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.22	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.33	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.22	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.06	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03



Summary of Chemical Analysis Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1810525	1810526	1810527	1810528	1810529	1810530
Sample ID	TP SBC004	TP SBC031	TP SBC031	TP SBC032	TP SBC032	TP SBC033
Depth	0.20	0.30	2.20	0.30	1.20	0.30
Other ID	2	3	10	2	8	3
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021	26/02/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.20	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	5.3	0.24	< 0.10	0.12	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

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Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id BH SBC012 16 2.40

Sample Numbers 1810520 1810531 1810532

Date Analysed 19/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	2.2
DETSC 2003# Loss On Ignition	%	6.4
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
#REF!	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	0.27	< 0.002	< 0.01
DETSC 2306 Barium as Ba	14	6.4	0.03	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	0.031	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.31	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.5	0.73	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	0.017	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	2	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	0.24	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	0.93	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	11000	1800	22	< 100
DETSC 2055* Fluoride as F	250	< 100	0.5	0.41
DETSC 2055 Sulphate as SO4	2900	640	< 20	< 100
DETSC 2009* Total Dissolved Solids	60000	22000	120	281.9
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	7.0	7.1
DETSC 2009 Conductivity uS/cm	85.9	31.1
* Temperature*	21.0	21.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.123

Stage 1

Volume of Leachant L2*	0.228
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.983
Volume of Eluate VE2*	0.94

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

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Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC002 5 1.00

Sample Numbers 1810523 1810533 1810534

Date Analysed 11/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.9
DETSC 2003# Loss On Ignition	%	4.4
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	4.8	1.4	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	< 0.40	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.59	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	2	< 1.3	0.004	< 0.01
DETSC 2055 Chloride as Cl	2100	560	< 20	< 100
DETSC 2055* Fluoride as F	260	110	0.52	1.28
DETSC 2055 Sulphate as SO4	8000	1200	< 20	< 100
DETSC 2009* Total Dissolved Solids	31000	8300	62	109.6
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.9	7.0
DETSC 2009 Conductivity uS/cm	44.1	11.9
* Temperature*	21.0	22.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.120

Stage 1

Volume of Leachant L2*	0.219
Volume of Eluate VE1*	0.14

Stage 2

Volume of Leachant L8*	0.958
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04426-1

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Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC031 10 2.20

Sample Numbers 1810527 1810535 1810536

Date Analysed 08/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.5
DETSC 2003# Loss On Ignition	%	4.3
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	10	3.1	0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	< 0.25	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.55	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	0.29	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01
DETSC 2055 Chloride as Cl	6000	1200	< 20	< 100
DETSC 2055* Fluoride as F	250	< 100	0.5	0.2
DETSC 2055 Sulphate as SO4	4300	1300	< 20	< 100
DETSC 2009* Total Dissolved Solids	67000	21000	134	247
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.6	6.8
DETSC 2009 Conductivity uS/cm	95.7	29.3
* Temperature*	21.0	22.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.124

Stage 1

Volume of Leachant L2*	0.233
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.994
Volume of Eluate VE2*	0.94

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample Id TP SBC032 2 0.30

Sample Numbers 1810528 1810537 1810538

Date Analysed 08/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	1.0
DETSC 2003# Loss On Ignition	%	5.4
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	< 0.16	< 0.002	< 0.01
DETSC 2306 Barium as Ba	4.7	1.1	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.3	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.86	< 0.40	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	< 0.090	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	1.5	< 1.3	0.003	< 0.01
DETSC 2055 Chloride as Cl	2400	1000	< 20	< 100
DETSC 2055* Fluoride as F	290	< 100	0.58	0.25
DETSC 2055 Sulphate as SO4	7400	1800	< 20	< 100
DETSC 2009* Total Dissolved Solids	33000	9100	66	111.9
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	6.6	6.8
DETSC 2009 Conductivity uS/cm	47.1	13.1
* Temperature*	22.0	22.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.114

Stage 1

Volume of Leachant L2*	0.203
Volume of Eluate VE1*	0.1

Stage 2

Volume of Leachant L8*	0.916
Volume of Eluate VE2*	0.85

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04426-1

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1810519	BH SBC012 3 0.20	SOIL	NAD	none	Keith Wilson
1810521	BH SBC015 1 0.20	SOIL	NAD	none	Keith Wilson
1810524	TP SBC003 2 0.20	SOIL	NAD	none	Keith Wilson
1810525	TP SBC004 2 0.20	SOIL	NAD	none	Keith Wilson
1810526	TP SBC031 3 0.30	SOIL	NAD	none	Keith Wilson
1810528	TP SBC032 2 0.30	SOIL	NAD	none	Keith Wilson
1810530	TP SBC033 3 0.30	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04426-1
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1810519	BH SBC012 0.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810520	BH SBC012 2.40 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810521	BH SBC015 0.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810522	BH SBC015 2.20 SOIL	25/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810523	TP SBC002 1.00 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810524	TP SBC003 0.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810525	TP SBC004 0.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810526	TP SBC031 0.30 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810527	TP SBC031 2.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810528	TP SBC032 0.30 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810529	TP SBC032 1.20 SOIL	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810530	TP SBC033 0.30 SOIL	26/02/21	GJ 60ml x2, PT 1L x3		
1810531	BH SBC012 2.40 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810532	BH SBC012 2.40 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810533	TP SBC002 1.00 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810534	TP SBC002 1.00 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810535	TP SBC031 2.20 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810536	TP SBC031 2.20 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810537	TP SBC032 0.30 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1810538	TP SBC032 0.30 LEACHATE	26/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-04299

Issued: 15-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-04299

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description One Soil sample.

Date Received 02-Mar-21

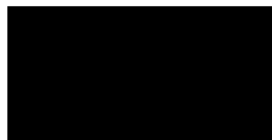
Date Started 02-Mar-21

Date Completed 15-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-04299

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC009	1	0.2	1809539	09/03/2021	Dark brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04299

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809539
Sample ID	BH SBC009
Depth	0.20
Other ID	1
Sample Type	ES
Sampling Date	24/02/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	7.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.4
Chromium	DETSC 2301#	0.15	mg/kg	15
Chromium III	DETSC 2301*	0.15	mg/kg	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	20
Lead	DETSC 2301#	0.3	mg/kg	38
Mercury	DETSC 2325#	0.05	mg/kg	0.08
Nickel	DETSC 2301#	1	mg/kg	7.8
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Zinc	DETSC 2301#	1	mg/kg	86
Inorganics				
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	6.6
pH	DETSC 2008#		pH	7.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.4
Total Organic Carbon	DETSC 2002	0.1	%	1.6
Organic matter	DETSC 2002#	0.1	%	2.8
Sulphide	DETSC 2024*	10	mg/kg	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	657

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04299

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809539
Sample ID	BH SBC009
Depth	0.20
Other ID	1
Sample Type	ES
Sampling Date	24/02/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-04299

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1809539
Sample ID	BH SBC009
Depth	0.20
Other ID	1
Sample Type	ES
Sampling Date	24/02/2021
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.06
Pyrene	DETSC 3303#	0.03	mg/kg	0.05
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.04
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.11
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-04299

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1809539	BH SBC009 1 0.20	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-04299
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1809539	BH SBC009 0.20 SOIL	24/02/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
 Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
 The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05777

Issued: 22-Mar-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05777

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description One Soil sample.

Date Received 16-Mar-21

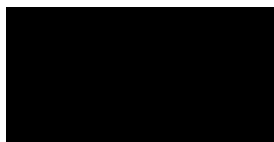
Date Started 18-Mar-21

Date Completed 22-Mar-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved B



Adam Fenwick
Contracts Manager



2139

Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05777

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
BH SBC022	1	0.2	1819042	22/03/2021	Brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05777

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1819042
Sample ID	BH SBC022
Depth	0.20
Other ID	1
Sample Type	ES
Sampling Date	11/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	6.6
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.9
Cadmium	DETSC 2301#	0.1	mg/kg	0.3
Chromium	DETSC 2301#	0.15	mg/kg	17
Chromium III	DETSC 2301*	0.15	mg/kg	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	16
Lead	DETSC 2301#	0.3	mg/kg	48
Mercury	DETSC 2325#	0.05	mg/kg	0.10
Nickel	DETSC 2301#	1	mg/kg	8.4
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5
Zinc	DETSC 2301#	1	mg/kg	59
Inorganics				
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	8.3
pH	DETSC 2008#		pH	7.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2
Total Organic Carbon	DETSC 2002	0.1	%	2.4
Organic matter	DETSC 2002#	0.1	%	4.1
Sulphide	DETSC 2024*	10	mg/kg	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1060
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01

Summary of Chemical Analysis Soil Samples

Our Ref 21-05777

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1819042
Sample ID	BH SBC022
Depth	0.20
Other ID	1
Sample Type	ES
Sampling Date	11/03/2021
Sampling Time	n/s

Test	Method	LOD	Units	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05777

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1819042	BH SBC022 1 0.20	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05777

Client Ref 4322A

Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1819042	BH SBC022 0.20 SOIL	11/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
<p>Key: G-Glass P-Plastic J-Jar T-Tub</p> <p>DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.</p>					

Soil Analysis Notes

<p>Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.</p> <p>Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.</p> <p>The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.</p>

Disposal

<p>From the issue date of this test certificate, samples will be held for the following times prior to disposal :-</p> <p>Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months</p>
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Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



Certificate of Analysis

Certificate Number 21-06835

Issued: 14-Apr-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-06835

Client Reference 4322A

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 9

Description 5 Water samples.

Date Received 31-Mar-21

Date Started 31-Mar-21

Date Completed 14-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Water Samples

Our Ref 21-06835

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1825731	1825732	1825733	1825734	1825735
Sample ID	BH SBC006	BH SBC008	BH SBC032A	SW SBC001	SW SBC002
Depth	3.74-7.00	1.10-4.00	6.09-7.00	0.00	0.00
Other ID	100	100	100	100	100
Sample Type	EW	EW	EW	EW	EW
Sampling Date	30/03/2021	30/03/2021	30/03/2021	30/03/2021	30/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic, Dissolved	DETSC 2306	0.001	mg/l	0.012	0.043	0.004	< 0.001	< 0.001	
Cadmium, Dissolved	DETSC 2306	0.0001	mg/l	0.0011	0.0036	< 0.0001	< 0.0001	< 0.0001	
Calcium, Dissolved	DETSC 2306	0.09	mg/l	320	16000	52	110	85	
Chromium III, Dissolved	DETSC 2306*	0.001	mg/l	1.2	0.035	0.006	< 0.001	0.002	
Chromium, Hexavalent	DETSC 2203	0.007	mg/l	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	
Copper, Dissolved	DETSC 2306	0.0004	mg/l	0.0324	0.0292	0.0081	0.0018	0.0021	
Iron, Dissolved	DETSC 2306	0.0055	mg/l	2.4	3.8	0.26	0.057	0.082	
Lead, Dissolved	DETSC 2306	0.0001	mg/l	0.027	0.015	0.0017	0.0003	0.0003	
Mercury, Dissolved	DETSC 2306	0.0001	mg/l	0.0010	0.0007	< 0.0001	< 0.0001	< 0.0001	
Nickel, Dissolved	DETSC 2306	0.0005	mg/l	0.025	0.18	0.0027	0.0006	0.0006	
Potassium, Dissolved	DETSC 2306	0.08	mg/l	29	350	5.1	2.3	2.4	
Selenium, Dissolved	DETSC 2306	0.0003	mg/l	0.0569	0.0388	0.0278	0.0012	0.0007	
Sodium, Dissolved	DETSC 2306	0.07	mg/l	70	2100	130	23	20	
Zinc, Dissolved	DETSC 2306	0.0013	mg/l	1.2	0.46	0.012	0.0031	0.0022	
Inorganics									
pH	DETSC 2008		pH	7.2	7.3	7.7	7.6	7.9	
Alkalinity as CaCO3 (Automated)	DETSC 2030	10	mg/l	230	250	160	210	190	
Biochemical Oxygen Demand, Total	DETSC 2031	1	mg/l	6.9	58	14	4.1	4.3	
Chemical Oxygen Demand, Total	DETSC 2032	10	mg/l	13	2400	14	< 10	12	
Cyanide, Free	DETSC 2130	0.02	mg/l	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Dissolved Organic Carbon	DETSC 2085	2	mg/l	50	440	38	< 2.0	3.4	
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	896	44400	169	326	265	
Suspended Solids	DETSC 2034	5	mg/l	4900	29000	6900	14	6.0	
Un-Ionised Ammonia	*	0.02	mg/l	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.046	0.13	< 0.015	0.17	< 0.015	
Chloride	DETSC 2055	0.1	mg/l	41	26	< 0.10	29	53	
Nitrate as NO3	DETSC 2055	0.1	mg/l	1.4	0.26	32	40	6.2	
Nitrite as NO2	DETSC 2055	0.1	mg/l	0.40	0.33	3.0	0.89	0.35	
Sulphate as SO4	DETSC 2055	0.1	mg/l	90	18	85	35	42	
Sulphide	DETSC 2208	0.01	mg/l	0.08	0.18	0.08	0.02	0.03	

Summary of Chemical Analysis

Water Samples

Our Ref 21-06835

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1825731	1825732	1825733	1825734	1825735
Sample ID	BH SBC006	BH SBC008	BH SBC032A	SW SBC001	SW SBC002
Depth	3.74-7.00	1.10-4.00	6.09-7.00	0.00	0.00
Other ID	100	100	100	100	100
Sample Type	EW	EW	EW	EW	EW
Sampling Date	30/03/2021	30/03/2021	30/03/2021	30/03/2021	30/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	11	< 1.0	< 1.0	< 1.0	
Aliphatic C10-C44	DETSC 3072*	1	ug/l	< 1.0	120	< 1.0	< 1.0	< 1.0	
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	49	4.9	< 1.0	< 1.0	
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	49	14	< 1.0	< 1.0	
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	9.2	2.2	< 1.0	< 1.0	
Aliphatic C35-C44	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	3.9	3.1	
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	150	< 1.0	< 1.0	< 1.0	
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	200	< 1.0	< 1.0	< 1.0	
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	120	< 1.0	< 1.0	< 1.0	
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	54	< 1.0	< 1.0	< 1.0	
Aromatic C35-C44	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic C10-C44	DETSC 3072*	1	ug/l	< 1.0	530	< 1.0	< 1.0	< 1.0	
Ali/Aro C10-C44	DETSC 3072*	1	ug/l	< 1.0	650	< 1.0	< 1.0	< 1.0	
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Summary of Chemical Analysis

Water Samples

Our Ref 21-06835

Client Ref 4322A

Contract Title A66 North Trans Pennine Scheme C Section 9

Lab No	1825731	1825732	1825733	1825734	1825735
Sample ID	BH SBC006	BH SBC008	BH SBC032A	SW SBC001	SW SBC002
Depth	3.74-7.00	1.10-4.00	6.09-7.00	0.00	0.00
Other ID	100	100	100	100	100
Sample Type	EW	EW	EW	EW	EW
Sampling Date	30/03/2021	30/03/2021	30/03/2021	30/03/2021	30/03/2021
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3304	0.05	ug/l	0.20	100	1.6	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	0.01	< 1.00	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.09	29	0.47	0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	0.04	20	0.29	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.03	33	0.34	0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	0.01	5.9	0.05	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.09	9.9	0.12	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.09	6.8	0.12	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.05	1.5	0.03	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	0.06	1.8	0.03	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.09	1.1	0.03	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.03	< 1.00	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.07	< 1.00	0.02	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.06	< 1.00	0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	0.01	< 1.00	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.06	< 1.00	0.02	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	0.99	210	3.2	< 0.20	< 0.20
Phenols								
Phenol - Monohydric	DETSC 2130	0.1	mg/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Information in Support of the Analytical Results

Our Ref 21-06835
 Client Ref 4322A
 Contract A66 North Trans Pennine Scheme C Section 9

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
1825731	BH SBC006 WATER	30/03/21	GB 1L x2, GV x2, PB 1L x2		
1825732	BH SBC008 WATER	30/03/21	GB 1L x2, GV x2, PB 1L x2		
1825733	BH SBC032A WATER	30/03/21	GB 1L x2, GV x2, PB 1L x2		
1825734	SW SBC001 WATER	30/03/21	GB 1L x2, GV x2, PB 1L x2		
1825735	SW SBC002 WATER	30/03/21	GB 1L x2, GV x2, PB 1L x2		

Key: G-Glass P-Plastic B-Bottle V-Vial
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Quality Control

Quality Systems

Derwentside Environmental Testing Services (DETS) employs numerous measures to ensure high levels of confidence in the results produced. Our laboratory has been accredited by the United Kingdom Accreditation Service (UKAS) since its inception and operates in full compliance with the internationally recognised standard ISO 17025:2017 and the Environment Agency's MCERTS (Monitoring & Certification Scheme) standard for soils and waters, which provides greater assurance to all parties of the reliability of data from chemical analysis.

To obtain a copy of our full UKAS schedule visit the UKAS website at [REDACTED] and search for our laboratory number 2139, or scan the QR code.



Proficiency Testing Schemes

DETS participates in six external proficiency testing schemes in order to monitor and ensure the continuing quality of analysis. These schemes cover soil, water and fuel analysis and the schemes are:



Contest

Aquacheck



Internal Quality Control

DETS runs a strict internal quality control system. A minimum of 5% of all samples that undergo analysis in our laboratories are quality control samples. This way we can ensure a high level of confidence in all of the analytical data produced. In addition, MCERTS accredited tests must meet strict, ongoing limits for precision and bias, to maintain their accreditation status.

The types of internal Analytical Quality Control (AQC) samples undertaken by DETS include Blanks, Internal QC, Calibration Checks, Surrogates and Internal Standards.

In addition to internal AQC, DETS also checks aspects of instrument performance. These checks are in general method specific. Examples are, but not limited to, retention time, peak area, signal to noise, SPE column, peak shape and peak tailing check standards.

Quality Control

Methods

DETS currently have over 140 documented methods for analytical analysis. The analytical methods are always available to employees for reference purposes. All the methods follow a documented procedure for content and headings, including health and safety, interferences, reagents and standards preparation, quality control, method procedure, analysis of results, acceptability criteria and disposal of waste.

Procedures

DETS currently have over 170 documented Standard Operating Procedures (SOPs), covering every section of the business.

The Key Quality procedures include:

- DETSC.SOP 1002 - Contract Review
- DETSC.SOP 1003 - Deviating Samples
- DETSC.SOP 1010 - Checking a Report
- DETSC.SOP 1206 - Supplier/Subcontractor Approval and Review
- DETSC.SOP 1401 - FERA Plant Health License
- DETSC.SOP 3001 - Analysis of AQC Samples
- DETSC.SOP 3004 - QC Chart Review
- DETSC.SOP 3005 - AQC Failure Reporting
- DETSC.SOP 3010 - Control of Nonconforming Testing
- DETSC.SOP 3102 - Complaint Handling
- DETSC.SOP 3103 - Corrective & Preventive Action
- DETSC.SOP 3201 - Uncertainty of Measurement
- DETSC.SOP 3204 - Validation, Evaluation and Revalidation of Methods
- DETSC.SOP 3401 - Documentation of Methods
- DETSC.SOP 3402 - Document Control - Issuing and Removal of Controlled Documents
- DETSC.SOP 3404 - Internal Audit Procedure
- DETSC.SOP 3407 - Training
- DETSC.SOP 3408 - Control of Records & Data
- DETSC.SOP 3411 - Archiving of Documents and Records
- DETSC.SOP 3412 - Competency
- DETSC.SOP 3501 - Handling PT Schemes
- DETSC.SOP 4203 - Handling Scheduled Samples
- DETSC.SOP 4204 - Handling Unscheduled Samples
- DETSC.SOP 4205 - Sending Subcontracted Samples

DETS also have documented procedures for equipment calibration and scheduled checks, including procedures for balances, hotblock digesters, furnaces, shakers, ovens, fridges, incubators, sonic baths, thermometers, timers, auto-dispensers and syringes.

Quality Control

Training

All new employees at DETS undergo a formal induction on the first day, covering an introduction to the Company, followed by an overview of the Quality Systems, the Environmental Systems and the Health and Safety Systems, Human Resources Systems, Information Technology Systems and finally an overview of the Laboratory Operations.

All new employees at DETS also undertake a Week 1 Induction schedule covering AQC Analysis and Failure Reporting and Basic Laboratory Skills.

All training on analytical methods follows a documented process requiring the employee to read and observe the method being conducted. The employee must then conduct the method under supervision on at least three occasions to the required standard before both the trainer, trainee and section manager sign the training record. Before the trainee can perform the method unsupervised, a method training verification (MTV) audit must be undertaken by a senior member of staff to verify the trainee is undertaking analysis to the required standard.

Competency

All employees will have their competency to undertake analytical methods assessed every year. Competency is usually assessed by PT Scheme Testing Results, Method Audits, MTV Audits or UKAS Audits.

If no record of competency is present within a 12-month period, the employee will have to undergo a MTV audit before undertaking any further analytical method analysis.

DETS INFO 008 – Sample Holding Time Information

Soil

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				pre drying/extraction ¹	post drying/extraction ²
Acid Herbicides	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
Aliphatic/Aromatic	Glass	20g	EPA Victoria	14 days	-
Ammonium	Glass or plastic	20g	E DIN 19746	3 days	30 days
Anions	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Boron	Glass or plastic	50g	BS ISO18512:2007	6 months	30 years
BTEX	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Carbonate	Glass or plastic	20g	Lab Validation	4 weeks	1 year
Chloride	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Conductivity	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Cyanide	Glass or plastic	20g	EPA SW-846 Chapter 3	14 days	-
Heavy metals	Glass or plastic	10g	BS ISO18512:2007	6 months	30 years
Hexavalent chromium	Glass or plastic	20g	BS ISO18512:2007	30 days	-
Loss on ignition	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
Mercury	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
OCP	Glass	20g	BS ISO18512:2007	1 month	-
Oil & grease	Glass	20g	EPA SW-846 Chapter 3	28 days	-
Organic matter/TOC	Glass or plastic	20g	EPA SW-846 Chapter 3	28 days	-
PAH	Glass	20g	EPA Victoria	14 days	-
PCB	Glass	20g	BS ISO18512:2007	1 month	-
pH	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Phenols	Glass	20g	EPA Victoria	14 days	-
PRO	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Sulphate	Glass or plastic	50g	BS ISO18512:2007	1 month	3 years
Sulphide	Glass or plastic	20g	EPA SW-846 Chapter 3	7 days	-
SVOC	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
TEM/CEM	Glass	20g	EPA Victoria	14 days	-
Total sulphur	Glass or plastic	20g	EPA Victoria	7 days	-
TPH (C10-C40)	Glass	20g	EPA Victoria	14 days	-
VOC	60ml glass jar	Full container	EPA SW-846 Chapter 4	7 days	-
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

¹ From sampling to extraction

² Once extracted

DETS INFO 008 – Sample Holding Time Information

Water

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				Preservative required	Holding Time
Acid Herbicides	Glass	500	EPA SW-846 Chapter 4	none	7 days
Alkalinity	Glass or plastic	100	ISO 5667 3:2018	none	2 weeks
Aluminium (Reactive)	Glass or plastic	50	DETS Stability Study	none	2 days
Ammonium	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	3 weeks
BOD	Glass or plastic	500	DETS Stability Study	none	2 days
Boron	Plastic	20	ISO 5667 3:2018	HNO3	6 months
Bromide	Glass or plastic	20	ISO 5667 3:2018	none	1 month
BTEX	Glass vial	Full container	EPA SW-846 Chapter 4	none	7 days
Chloride / Fluoride	Glass or plastic	20	ISO 5667 3:2018	none	1 month
COD	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	6 months
Conductivity	Glass or plastic	100	ISO 5667 3:2018	none	1 day
Cyanide	Glass or Plastic	50	EPA SW-846 Chapter 3	NaOH	14 days
Hexavalent chromium	Glass or plastic	20	ISO 5667 3:2018	none	4 days
Metals (including Hardness)	Glass or plastic	20	EPA SW-846 Chapter 3	HNO3	6 months
Mercury	Glass or plastic	20	ISO 5667 3:2018	HNO3	6 months
Nitrate	Glass or plastic	20	EPA SW-846 Chapter 3	none	28 days
Nitrite	Glass or plastic	20	DETS Stability Study	none	5 days
OCP	Glass	500	ISO 5667 3:2018	Dark Glass	7 days
Oil & grease	Glass	500 (Separate bottle)	ISO 5667 3:2018	HCl / HNO3 / H2SO4	1 month
PAH	Glass	500	ISO 5667 3:2018	none	4 days
pH	Glass or plastic	50	ISO 5667 3:2018	none	1 day
PCB	Glass	500	EPA Victoria	none	7 days
Phenols	Glass	500	ISO 5667 3:2018	H3PO4 / H2SO4	21 days
Phosphate	Glass or plastic	20	DETS Stability Study	none	5 days
Phosphorus	Glass or plastic	20	EPA Victoria	HNO3	28 days
PRO	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO3 / H2SO4	7 days
Sulphate	Glass or plastic	20	ISO 5667 3:2018	none	1 month
Sulphide	Plastic	50	ISO 5667 3:2018	Zinc acetate / Na2CO3	7 days
Suspended solids	Glass or plastic	100	ISO 5667 3:2018	none	2 days
SVOC	Glass	500	EPA SW-846 Chapter 4	none	7 days
TDS / Total Solids	Glass or plastic	500	ISO 5667 3:2018	none	7 days
Thiocyanate	Glass or plastic	50	DETS Stability Study	none	3 days
TOC/DOC	Glass or plastic	20	EPA SW-846 Chapter 3	H2SO4	28 days
TON	Glass or plastic	20	DETS Stability Study	none	5 days
TPH/EPH	Glass	500 (Separate bottle)	ISO 5667 3:2018	none (HCl / HNO3)	4 days (1 Month)
VOC	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO3 / H2SO4	7 days
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

DETS INFO 008 – Sample Holding Time Information

Fuel

Due to the nature of fuel samples, no sample holding time is appropriate.

Asbestos

Due to the nature of asbestos samples, no sample holding time is appropriate.

Whole Oil Interpretation

Due to the nature of whole oil interpretation, no sample holding time is appropriate.

Unaccredited Methods

As unaccredited methods may not have undertaken a full validation programme, no sample holding time study has been undertaken. A study will be conducted (if required) during the process of accreditation of the method.

Sample Transport Environment

$5 \pm 3^{\circ}\text{C}$

Sample Storage environment

$3 \pm 2^{\circ}\text{C}$

DETS INFO 001 - Analytical Method Summary

Method Number	Title	Description	Reference	LOD	Accreditation Status
DETSC 1001	Sample Pre-Treatment and Preparation of Solids	Solid samples are classified and identified. Samples requiring analysis for unstable or volatile determinands are analysed as received. Samples requiring analysis for stable and non-volatile determinands are dried at <30°C or 50°C, depending on requirements, for a minimum of 16hrs (overnight). Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill and sieved through a 250µm sieve to ensure they are homogenous.	BS1377:1990 – Soils for Civil Engineering Purposes The preparation and pre-treatment of potentially contaminated soils prior to chemical analysis – MEWAM – 2006 – Environment Agency	n/a	Not Accredited
DETSC 1002	Description of Soil Sample Type	This method outlines the procedure used to describe soil samples with respect to basic type, predominant colour and inclusions. The procedure is carried out during the sample preparation stage.	BS 5930:Section 6:1999	n/a	Not Accredited
DETSC 1003	Stone and Glass / Metal / Plastic Content of Soil	This method outlines the procedure used to determine the Stone and Glass/Metal/Plastic content of soil samples. The procedure is carried out during the sample preparation stage.	BS 3882:2007 BS 1377:1990	0.10%	Not Accredited
DETSC 1004	Natural Moisture Content / Loss on Drying of Soil	Loss on drying is determined by loss of mass on drying in an oven set at 28°C. Moisture content is determined by loss of mass on drying in an oven set at 105°C. The procedure is carried out during the sample preparation stage.	Practical Environmental Analysis, Radojevic & Bashkin, RSC 1999 BS 1377: Part 2:1990 DETS drying time study	0.10%	Not Accredited
DETSC 1005	Soil Crushing	Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill to ≤250µm to ensure they are homogenous.	In-house Method	n/a	Not Accredited
DETSC 1006	Soil Weighing	Soil samples are weighed to predefined tolerances into batches in preparation for extraction and analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1007	Batch Scanning	Batches of soil prepared as per DETSC 1006 – Soil Weighing are scanned to create LIMS worksheets for individual method extraction and analysis. Addition of extraction reagents followed by shaking or standing overnight of certain methods is also conducted.	In-house Method	n/a	Not Accredited
DETSC 1008	Handling Liquid Samples	Liquid samples are filtered and/or fixed before analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1009	Leachate Preparation (NRA Method and BS EN 12457 Parts 1-3)	Leachates are prepared as per the NRA (1994) method and as per BS EN 12457 Parts 1 - 3 one and two stage leachate preparation.	Leaching Test Method for the Assessment of Contaminated Land, Interim Guidance, NRA(1994) BS EN 12457 Part 1,2 & 3	n/a	Not Accredited
DETSC 1010	Leaching Characteristics of Moulded and Monolithic Building or Waste Materials	A block of the material to be analysed is placed into an appropriate container ensuring that there is a gap of at least 2cm around the test piece on all sides (including the base). The container is then filled with deionised water and covered. At set time periods, the water is drained from the container which is then re-filled. The water drained out of the container is retained and analysed for the components of interest.	EA NEN 7375:2004 – Leaching Characteristics of Moulded or Monolithic Building and Waste Materials	n/a	Not Accredited
DETSC 1101	Asbestos - Bulk Analysis	Samples are examined visually for the presence of asbestos containing materials or asbestos fibres. Suspect fibres are removed from the sample and examined using polarised light microscopy to determine whether they are asbestos fibres. If no asbestos fibres are identified by the method after an adequate length of examination time, and after at least two small pinch samples have been examined, then the sample may be reported as 'NAD' (no asbestos detected).	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures, 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Research Institute, 1987 LAB 30, Application of ISO/IEC17025 for Asbestos Sampling and Testing, UKAS, Edition 3, January 2015	n/a	UKAS

DETSO 1102	Quantification of asbestos in soils, loose aggregates and ballast	The method of quantification is divided into three procedures: Gravimetric analysis, detailed gravimetric analysis and PCOM analysis. The analysis may be affected by the client's requirements as determined by contract review, and by the nature of the asbestos found in the sample, e.g. whether ACMs are present, and whether fibre bundles large enough to pick out using tweezers are found in the sample.	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures. 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Research Institute, 2005 HSG264 Asbestos: The survey guide. HSE Books, 2010 Davies, L. S.T., Wetherill, G. Z., McIntosh, C., McGonagle, C., Addison, J. 1996. Development and validation of an analytical method to determine the amount of asbestos in soils and loose aggregates. HSE Contract Research Report NO. 83/1996. HSE Books	Gravimetric Analysis: 0.01% for 1kg sample Detailed Gravimetric Analysis: 0.001% for 50g sample PCOM Analysis: 0.001%	UKAS
DETSO 1103	Asbestos Water Absorption Test	This test involves a sample of the asbestos product being dried and weighed before being immersed in water for a period of time. The sample is then removed from the water and re-weighed. If the amount of water absorbed is <30% by weight, then the sample should be reported as 'Not Licensed'. If ≥30% water is absorbed then the sample should be reported as being 'Licensed', i.e. an asbestos material for which a licence is required to work on.	Work with Materials Containing Asbestos: Approved Code of Practice and Guidance. HSE Books, 2006.	n/a	UKAS
DETSO 1104 (DRAFT)	Respirable Fibres in Soil and Dust	The analysis can follow-on from a quantitative analysis, or be scheduled as a test on its own, according to client requirements. A known mass of between 8g and 12g is removed and mixed with 1000ml of water. The mixture is stirred for 1 hour using a magnetic stirrer. A portion of the mixture is filtered through a 10 micron pore size filter, to collect a filtrate containing a sample of the respirable dust. The mass of respirable (PM10) dust per ml of the filtrate is calculated, and this value is used to decide how much of the filtrate is to be used for the rest of the analysis. Then, a known quantity of the filtrate is filtered through a cellulose-ester filter papers with a pore size of 0.8-1.2 microns. The filter is then placed onto a microscope slide, allowed to air dry, and then cleared and fixed using the acetone/triacetin method described in HSG 248. The filter is then evaluated using PCOM. From the number of respirable fibres observed on the slide the number of respirable fibres per mg of dust is calculated.	Asbestos: The analyst's guide for sampling, analysis and clearance procedures. HSG248, HSE Books, 2005 Asbestos: The survey guide. HSG264, HSE Books, 2012.	n/a	Not Accredited
DETSO 2002	Organic matter content of soil	The procedure is based upon Walkley and Black's method. Organic matter in soil is oxidised with potassium dichromate in the presence of concentrated sulphuric acid. The excess dichromate is titrated with ferrous sulphate using diphenylamine as an external indicator. The organic matter content is calculated from the amount of dichromate used during the oxidation process based on an empirical relationship.	BS1377 : Part 3 : 1990 Method 3 BS1377 : Part 1 : 1990 BS 3882:2007	0.10%	MCERTS(Soils)
DETSO 2003	Loss On Ignition	Soil is ignited at 440C and the amount of sample lost on ignition is determined gravimetrically. Other specified temperatures may be used but are not accredited.	BS1377 : Part 3 : 1990 Method 4 BS1377 : Part 1 : 1990	0.01%	MCERTS(Soils)
DETSO 2004	Sulphate and Total Sulphur Content of Soil, Aggregate and Water	The sulphate in the soil is dissolved in dilute hydrochloric acid, or in an aqueous extract having a water:soil ratio of 2:1 and the insoluble residue is removed by filtration. Waters are also filtered prior to analysis. The sulphate in the filtrate is precipitated as barium sulphate which is then filtered, ignited and weighed. Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3 : 1990 Method 5 BS1377 : Part 1 : 1990 BRE SD1: 2005 Concrete in Aggressive Ground	Acid Soluble: 0.01% Water Soluble: 100mg/l Waters: 10mg/l	MCERTS(Soils) Not Accredited (Aggregates)
DETSO 2005	Carbonate content of soil by Rapid Titration	The carbonate present in the soil reacts with a known excess of hydrochloric acid liberating carbon dioxide. The acid remaining after the reaction is determined by titration against sodium hydroxide. The result is calculated in terms of the equivalent proportion of carbon dioxide.	BS 1377: Part 1: 1990 BS 1377: Part 3: 1990: Method 5	1%	UKAS
DETSO 2006	Water Soluble Chloride Content of Soil & Chloride Content of Water	Chloride in the soil is extracted in deionised water and the insoluble material is removed by filtration. Water samples are filtered prior to analysis. The chloride in solution is analysed by titration using Mohr's method titration with standard silver nitrate solution using potassium chromate as an indicator.	BS1377 : Part 3 : 1990 Method 7.2 BS1377: Part 1: 1990	Soil: 0.01% Water: 10mg/l	UKAS
DETSO 2007	Acid Soluble Chloride Content of Soil and Concrete	The chloride in the sample is dissolved in nitric acid and the insoluble material is removed by filtration. The dissolved chloride is analysed by Volhard's method. The chloride in solution is precipitated with a known excess of standard silver nitrate. The excess silver nitrate is titrated against standard ammonium thiocyanate using ferric alum as an indicator. The colour change is white to red.	BS1377 : Part 3 : 1990 Method 7.3 BS1377: Part 1: 1990 BS 1881-124:1988	0.01%	UKAS

DETSC 2008	pH Value of Soil and Water	The pH value of a soil suspension in water or a groundwater sample is determined electrometrically using a glass electrode.	BS1377: Part 3: 1990 – Soils for Civil Engineering Purposes – Chemical and Electrochemical Methods	n/a	MCERTS (Soils) UKAS (Waters)
DETSC 2009	Electrical Conductivity of Soil & Water	The electrical conductance of a soil suspension in water or of a water sample is determined by voltammetry using a conductivity meter. In some cases, the soil may need to be extracted with an aqueous solution of an inorganic salt e.g. the conductivity of topsoil is determined by preparing a suspension of the soil in saturated calcium sulphate.	Standard Methods for the Examination of water and Wastewater Part 2510B 21st Edition 2005 APHA, AWWA, WEF BS3882:2007 Specification for Topsoil	1uS/cm	UKAS
DETSC 2010	Chloramine in Water Samples	Free available residual chlorine reacts with diethyl-p-phenylenediamine (DPD) to produce a pink/red coloured complex. The addition of a small amount of potassium iodide causes mono-chloramine to produce the same pink/red colour with the same reagent. Further addition of an excess of iodide causes di-chloramine and any nitrogen tri-chloride to react and produce a colour. The pink/red coloured complex is titrated with ferrous ammonium sulphate to a clear endpoint.	In-house Method	100µg/l	Not Accredited
DETSC 2011	Acid Alkali Reserve	An initial pH value is obtained for the sample. The sample is then titrated with either hydrochloric acid or sodium hydroxide to a pH of 7.00. From this result, the acid/alkali reserve value can be calculated.	In-house Method	TBC	Not Accredited
DETSC 2012	Biofilm Potential of Sewage and Sludges	Sodium hypochlorite solution is added to the sample in small increments. The sample temperature is monitored during the additions until no further changes in temperature occur due to all of the bacteria in the sample having been effectively neutralised.	In-house Method	TBC	Not Accredited
DETSC 2013	Gravimetric Carbonate Content of Soils	A dried and finely crushed portion of the sample is ashed in a muffle furnace at 440°C for 4 hours to burn off any organic materials in the sample. The crucible containing the sample is then allowed to cool and is re-weighed and then returned to the furnace at a temperature of 950°C which will break down any carbonates present and release them as carbon dioxide gas. The carbonate content of the sample is then determined by calculation.	The British Calcium Carbonates Federation–Calcium Carbonate – Occurrence and uses	0.10%	Not Accredited
DETSC 2014	Total and Available Lime Content	Samples for Total Lime are extracted with hot hydrochloric acid and analysed for calcium by ICP-OES. Samples for available lime content are extracted with hot water using granulated sugar as a catalyst and analysed by titration with standardised hydrochloric acid.	BS 4551: Part 2: 1998– Methods of testing mortars, screed and plasters. Chemical analysis and aggregate grading	TBC	Not Accredited
DETSC 2015	Initial Consumption of Lime	The pH of a saturated calcium hydroxide solution is measured at ambient temperature. Several portions of the sample to be analysed are weighed out and differing amounts of lime are added to each one. The samples are mixed with water and then shaken. After shaking the pH of each portion is determined and a graph plotted of pH against percentage of lime. From this graph, the initial consumption of lime is determined (this is the lime percentage at which the sample pH is the same as that of the saturated calcium hydroxide solution).	BS 1924: Part 2: 1990 – Stabilized materials for civil engineering purposes. Methods of test for cement-stabilized and lime-stabilized materials	TBC	Not Accredited
DETSC 2016	Redox Potential of Soil and Water	Redox potential is measured using a probe with two electrodes, one of platinum and the other of silver chloride between which the potential of the solution being tested is measured in millivolts. The probe is placed into the sample and a direct reading in millivolts is given on the meter attached to the redox probe. Soils are analysed by preparation of a 2:1 water to soil sludge.	Encyclopaedia of Soils in the Environment 2005 – Redox Potential	n/a	Not Accredited
DETSC 2017	Salinity of Soils and Waters by Calculation	The conductivity of the sample is measured in µS/cm and from this result the salinity is calculated.	Method 2520B - Standard Methods for the Examination of Water and Wastewater - 21st Edition – 2005	n/a	Not Accredited
DETSC 2018	Specific Gravity of Sludge	The 'as received' sample is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed, and the specific gravity of the sample is calculated.	In-house Method	n/a	Not Accredited

DETSC 2019	Loose Packed Dry Soil Density	Dried, ground soil is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed and the density of the soil calculated.	BS3882:2007 Specification for Topsoil	n/a	Not Accredited
DETSC 2024	Sulphide in Soil and Water by Iodometry	Hydrogen sulphide is liberated by acidification of the sample with hydrochloric acid in a steam distillation unit. The hydrogen sulphide produced is carried over with the steam and is absorbed in alkaline zinc acetate. The zinc sulphide produced reacts with iodine formed when iodate-iodide is acidified and the excess iodine titrated with standard thiosulphate.	In House Method based on: Environment Agency - The determination of easily liberated sulphide in soils and similar matrices (2010) - Blue Book 228 Method D - The determination of easily liberated sulphide in as received or air-dried samples following acid steam distillation with iodometric titration The determination of sulphide in waters and associated materials (2007) Draft Method D - The determination of easily liberated sulphide in as received or air-dried samples following phosphoric acid steam distillation with iodometric titration.	Soils: 10mg/kg Waters: 250ug/l	Not Accredited
DETSC 2025	Volatile Fatty Acids in Waters and Sludges	Volatile fatty acids are esterified with acidic ethylene glycol. The resultant esters are reacted with hydroxylamine to form hydroxamic acids. Addition of iron (II) chloride causes formation of purple coloured ferric hydroxamates which are determined spectrophotometrically at 500nm.	Determination of Volatile Fatty Acids in Environmental Aqueous Samples - Polish Journal of Environmental Studies Volume 17, No. 3 (2008), 351-356. Volatile Fatty Acids Production By Anaerobic Fermentation Of Urban Organic Wastes - C. Sans, J. Mata-Alvarez, Department of Chemical Engineering, University of Barcelona Determination of Volatile Fatty Acids in Sewage Sludge - Methods for the Examination of Waters and Associated Materials Book 21 ISBN 011-751462-4	20mg/l	Not Accredited
DETSC 2026	AOC, pH and Alkalinity of Solid Soaps and Detergents	A representative portion of the sample is weighed out and dissolved in water. The pH is measured on the liquid produced using a calibrated pH meter. The same solution is then titrated with standard sulphuric acid using methyl orange as an indicator and from this result the alkalinity is calculated. The active oxygen content is measured by digesting the sample with sulphuric acid and then titrating with potassium permanganate solution.	ISO 4321:1977 - Washing Powders - Determination of AOC - Titrimetric Method	TBC	Not Accredited
DETSC 2030	Alkalinity in Water	The alkalinity of a sample of water or leachate is determined by potentiometric or indicator end point titration with a strong acid from sample pH to pH 8.3 (where applicable) and then to pH 4.5. From the titres obtained the total alkalinity and concentrations and types of alkalinity present can be calculated.	SCA Method ISBN 0 11 751601 5 The Determination of Alkalinity and Acidity in Water 1981 Instruction Manual for Skalar SP50 Robotic Analyser	20mg/l as CaCO ₃	UKAS
DETSC 2031	5 Day Biochemical Oxygen Demand	The sample, either diluted or undiluted, is placed in a BOD bottle and the initial dissolved oxygen content of the sample is measured using a dissolved oxygen meter. The bottle is placed in an incubator at 20°C in the dark for 5 days. After this time the bottle is removed and the residual dissolved oxygen content of the sample is measured. The BOD of the sample is calculated from the reduction in the concentration of dissolved oxygen over 5 days.	SCA Method ISBN 0 117522120 5 Day Biochemical Oxygen Demand (BOD5) Second Edition 1988	1 mg/l	UKAS
DETSC 2032	Chemical Oxygen Demand	Oxidisable substances react with sulphuric acid - potassium dichromate solution in the presence of silver sulphate as a catalyst. Chloride is masked by mercury sulphate. The reduction in the yellow colouration of Cr ⁶⁺ is evaluated using a spectrophotometer for the low range tubes (LCK 314) whilst the green colouration of Cr ³⁺ is evaluated for the medium and high range tubes (LCK 014 and LCK 114).	Environment Agency The determination of chemical oxygen demand in waters and effluents (2007) Methods for the Examination of Waters and Associated Materials	10 mg/l	UKAS MCERTS - Trade Effluent ONLY
DETSC 2033	Total and Dissolved Organic Carbon in Water	The term TOC (Total Organic Carbon) is used to describe the total content of organically bound carbon in dissolved and undissolved compounds. The TOC content is expressed in mg/l. If DOC (Dissolved Organic Carbon) is required, samples are filtered through a 0.45µm filter paper prior to analysis. Inorganic carbon is expelled by acidification of the sample. TOC is then determined by digestion of the sample with sulphuric acid and peroxodisulphate. Carbon containing compounds are transformed into carbon dioxide. The carbon dioxide evolves and reacts with an indicator solution. The colour change is measured using a spectrophotometer.	Hach-Lange Technical Instructions: LCK 385, LCK 386	2 mg/l	UKAS
DETSC 2034	Suspended and Settleable Solids in Water	Suspended matter is removed from a measured volume of sample by filtration under reduced pressure through a pre-treated, pre-weighed glass fibre filter paper. The paper is washed with deionised water to remove dissolved salts and the total suspended matter is determined gravimetrically after drying at 105 ±5°C. Settleable solids are determined by subtracting the solids left in suspension after settlement for 1 hour (or other agreed time) from the total suspended matter in the sample.	SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980	5 mg/l	Suspended Solids: UKAS Settleable Solids: Not Accredited

DETS 2035	Total Solids, Total Dissolved Solids and Total Volatile Solids in Water	<p>For total dissolved solids determination: Water samples are pre-filtered to remove any suspended solids and evaporated in an oven at 180°C. The amount of residual dissolved solids is determined gravimetrically. An estimate of the total dissolved solids can be obtained by measuring the conductivity of the sample and performing an empirical calculation from the conductivity obtained.</p> <p>For total solids and total volatile solids: The sample is shaken to ensure homogeneity of any suspended matter. The sample is then evaporated and the result is determined gravimetrically as for total dissolved solids. If total volatile solids is required on the sample, the container used for the total solids determination is retained and heated in a muffle furnace to 440°C and a further gravimetric determination is made.</p>	<p>SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980.</p> <p>BS1377: Part 3 : 1990 Section 8</p>	5 mg/l	<p>Total Dissolved Solids: UKAS</p> <p>Total Solids & Total Volatile Solids: Not Accredited</p>
DETS 2036	Combustibility of Solids	A representative sample of 10 to 20g of the material to be tested is placed on a gauze mat and heated using a blowtorch. The sample is observed during and after heating and a determination of the behaviour of the sample during the test is made using a standard set of definitions.	EN ISO 1182:2010 Reaction to Fire Tests for Products – Non-Combustibility Test	n/a	Not Accredited
DETS 2037	Turbidity in Waters	Samples are measured on a turbidity meter. The instrument measures turbidity in the sample by passing light at a wavelength of 860nm through a glass vial containing the liquid to be analysed. Light scattered by the sample is detected at an angle of 90° by a photo-diode and a result is displayed on the instrument screen, with results being based on a set of calibration standards for which the instrument stores a calibration graph.	Standard Methods for the Examination of Water and Wastewater 21st Edition	1.00 NTU	Not Accredited
DETS 2038	Total and Free Chlorine in Water	The sample is reacted with diethyl-p-phenylenediamine (DPD) in an ethylene diamine tetra-acetic acid (EDTA) buffer for free chlorine. For total chlorine analysis, potassium iodide is added as well to break down any chloramine compounds in the sample so that the chlorine is released to react with the DPD. Samples for both tests are then analysed colourimetrically at a wavelength of 510nm using a small bench top photometer.	Methods for the Examination of Waters and Associated Materials - Chemical disinfecting agents in waters and effluents (2008)	0.1mg/l	Not Accredited
DETS 2039	Cation Exchange Capacity of Soil	The sample is saturated with Ba ²⁺ ions by mixing with a barium chloride solution. The barium is then exchanged with Mg ²⁺ by reaction with magnesium sulphate forming a precipitate of barium sulphate. The quantity of Mg ²⁺ ions adsorbed (i.e. the CEC value) is determined by loss from magnesium sulphate solution added. This is determined by titration with an ethylene diamine tetra-acetic acid solution using eriochrome black as an indicator.	CEC & Kd Determination in Landfill Performance Evaluation - A review of methodologies and preparation of standard materials for laboratory analysis. BaCl ₂ /triethanolamine method. PR: P1/254/01	1 meq/100g	Not Accredited
DETS 2040	Sediment Oxygen Demand	The sample to be analysed is placed into a BOD bottle and covered with water saturated with oxygen, which also contains nutrients to promote bacterial growth. The oxygen level in the supernatant liquid is monitored for up to three hours. From the decrease in oxygen content of the supernatant liquid, the SOD rate can be determined.	<p>Nutrient Release and Sediment Oxygen Demand in a Eutrophic Land-Locked Embayment in Hong Kong – Environment International Journal Volume 26 (2001)</p> <p>Sediment Oxygen Demand and Biochemical Oxygen Demand: Patterns of Oxygen Depletion in Tidal Creek Sites - Program in Marine Science, University of North Carolina at Wilmington (2003)</p>	n/a	Not Accredited
DETS 2047	Formaldehyde in Water	Formaldehyde in soil is extracted in water, with a water to soil ratio of 10:1. The insoluble residue is removed by filtration prior to analysis. Waters are filtered prior to analysis to remove any particulates in suspension. Formaldehyde in the extract or water sample reacts with chromotropic acid-sulphuric acid solution to form a purple coloured complex. The absorbance of the coloured solution is read at 580nm using a suitable visible spectrophotometer.	Formaldehyde by visible absorption spectrophotometry – Method 3500, Issue 2 – NIOSH Manual of Analytical Methods, Fourth edition, August 1994	<p>Soil: 0.2mg/kg</p> <p>Water: 20µg/l</p>	Not Accredited
DETS 2048	Dissolved Oxygen Content of Water	The dissolved oxygen content of the sample is measured using a dissolved oxygen meter either electrochemically or by fluorescence, or by the titrimetric method developed by Winkler.	<p>SCA Method ISBN 0.11 751442X.</p> <p>Dissolved Oxygen in Natural and Waste Waters 1979</p>	0.1 mg/l	Not Accredited
DETS 2055	Anions in Water and Aqueous Soil Extracts by Ion Chromatography	Liquid samples and aqueous soil extracts are filtered through a 0.22µm syringe filter prior to analysis. The filtered samples are injected into an Ion Chromatograph. The anions of interest are separated on the basis of their affinity for the active sites of the column packing material. The separated anions are converted into their highly conductive acid forms and measured by conductivity. The anions are identified on the basis of retention time as compared to standards and quantisation is by measurement of peak area.	Standard Methods for the Examination of Water and Wastewater Section 4110 21st Edition 2005 APHA, AWWA, WEF	<p>Soil: 1.0 mg/kg</p> <p>Water: 0.1 mg/L</p>	UKAS (except Br)
DETS 2065	Cement Content of Concrete and Mortar	The concrete or mortar sample is dried and finely crushed, then digested with hydrochloric acid and filtered to remove the remaining solids, collecting the filtrate for further analysis. The remaining solids are then re-digested using an alkaline solution of sodium carbonate and ammonium chloride and re-filtered. The resulting filtrate is combined with that produced during the first stage of the extraction which is then analysed for calcium and silicon contents by ICP-OES. The remaining solids are ashed at 800°C to determine the insoluble residue content of the sample. A loss on ignition of the original sample is also performed. From these results a series of calculations can be made to determine the soluble silica, calcium oxide and cement content of the sample.	BS1881:Part124:1988 Methods for analysis of hardened concrete	n/a	Not Accredited
DETS 2066	Gypsum Content of Soil by Acetone Precipitation	The sample is mixed with water and filtered. The filtrate is then mixed with acetone to precipitate out the gypsum. The precipitate is separated out using a centrifuge then re-dissolved in water. The conductivity of the resulting solution is measured from which the gypsum content is calculated.	ASTM C 471M-01 Standard Test Methods for Chemical Analysis of Gypsum and Gypsum Products	TBC	Not Accredited
DETS 2067	Rapid Chemical Test for Detecting High Alumina Cement Concrete	This is an empirical test to determine the presence or absence of high alumina cement in the sample, it does not provide a quantitative result. The sample is reacted with Oxine reagent in acidic solution. If high alumina cement is present, a yellow precipitate is formed.	BRE Centre for Concrete Construction Special Digest 3 – HAC Concrete in the UK: Assessment, Durability Management, Maintenance and Refurbishment	n/a	Not Accredited

DETSO 2073	Acid Neutralisation Capacity of Soils and Other Solids	ANC is a measure of the buffering capacity of soils and other waste materials. The analysis measures the amount of acid required to bring the sample to a fixed pH. The initial pH of the sample extract must be measured before analysis begins. Analysis is performed by the addition of acid in conjunction with pH measurement by pH meter until the specified pH has been reached as indicated by the meter. The result is expressed in mol/kg (dry wt).	Annex B (Preliminary determination of the acid/base consumption) – CEN/TC 292 – WI 292046 – Characterization of waste – Leaching behaviour tests – Acid and Base neutralization capacity test	1.0 mol/kg	Not Accredited
DETSO 2076	Sulphate and Magnesium Content of 2:1 Aqueous Extract of Soil by ICP-OES	The sulphate and magnesium in the soil are extracted in an aqueous extract having water: soil ratio of 2:1 and the insoluble material is removed by filtration. The concentrations of sulphate and magnesium in the filtrate are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelengths used for identification and quantification are 181.972nm for sulphate and 285.213nm for magnesium.	BS1377 : Part 3: 1990 Method 5 BS1377 : Part 1: 1990 TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1:2005 Concrete in Aggressive Ground 2005	10mg/L	Sulphate: MCERTS(Soils) Magnesium: Not Accredited
DETSO 2084	Total Organic Carbon by PrimacATC Analyser	Soil samples are treated with phosphoric acid to expel any inorganic carbonates. The samples are then heated at high temperature in a continuous flow of air so that any organic carbon is oxidised to carbon dioxide. The gas is then allowed to cool and analysed by an infra-red detector.	PrimacATC Analyser – User Manual, Skalar	0.47%	MCERTS(Soils)
DETSO 2085	Total and Dissolved Organic Carbon in Water	Direct TOC Analysis - The sample is acidified, stirred and purged to remove the IC before the sample is injected and handled as in the TC Analysis. The sample is filtered before acidification for DOC. TC Analysis - The sample is injected by an automated septum less rotary port into a high temperature reactor. In the reactor, at a temperature of 750 - 950°C all organic and inorganic carbon is oxidized to the gaseous carbon dioxide (CO ₂). The catalyst that is present in the reactor catalysis the oxidation to completion. A flow of air transports these oxidation products to the detectors. The oxygen required for reaction is taken from the airflow. The products are led into the non-dispersive infrared detector where the carbon dioxide is determined. The carbon dioxide is measured at a wavelength of 4.2 µm by NDIR detection.	Standard Methods for the Examination of Water and Wastewater Section 5310 B 21st Edition 2005 APHA, AWWA, WEF. HMSO Methods for the Examination of Waters and Associated Materials – The Instrumental Determination of Total Organic Carbon and Related Determinands 1995	lmg/l as C	UKAS
DETSO 2119	Exchangeable Ammonia in Soil	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	MAFF/ADAS Reference Book 427 – the Analysis of Agricultural Materials – Method 53, Ammonium, Nitrate and Nitrite-Nitrogen, Potassium Chloride Extractable	0.5mg/kg	MCERTS(Soils)
DETSO 2120	Ammonia in Water by Spectrophotometry	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	Environment Agency Ammonia in Waters 1981 ISBN 0117516139. Methods for the Examination of Waters and Associated Materials	20µg/l	UKAS
DETSO 2121	Total Kjeldahl Nitrogen Content of Soils and Waters	The sample is digested with sulphuric acid and a mixture of catalysts to convert organic nitrogen to ammonia. The sample is then distilled under alkaline conditions, and the distilled ammonia is absorbed in sulphuric acid. The ammonia content of the distillate is then determined colorimetrically either using the UV/vis spectrophotometer or the Konelab 60i. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm	The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427 – HMSO. BS 3882: 2007 Specification for topsoil. Standard Methods for the Examination of Water and Wastewater Part 4500-N, 21st Edition 2005 APHA, WWA, WEF	Soil: 0.01% Water: 2mg/l	Not Accredited
DETSO 2122	UV Light Transmittance in Waters	The absorbance of a water sample is measured at a wavelength of 254nm in a 10mm glass or quartz cell using deionised water as a blank. The percentage UV transmission of the sample is then calculated from the absorbance result.	Ultraviolet Light Factsheet - Treatment of Residential Drinking Water Using UV – Water Quality Association	n/a	Not Accredited
DETSO 2123	Water Soluble Boron in Soil & Boron in Water	Boron in soil is extracted in boiling saline water. Waters are filtered prior to analysis to remove any particulates in suspension. The water soluble boron in the extract or filtrate reacts with azomethine-H to produce a yellow coloured complex. The resulting colour absorbance is measured at 420nm using a suitable visible spectrophotometer.	SecondSite Property (now National Grid Property Holdings) - Guidance for assessing and managing potential contamination on former gasworks and associated sites (Part 1) (Version 3) Method 17.12 The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	Soil: 0.2mg/kg Water: 100ug/L	MCERTS(Soils)
DETSO 2124	Reactive Aluminium in Waters and Leachates	Aluminium reacts with Catechol violet in a suitably buffered solution (pH 6.1) to form an aluminium-catechol violet complex which can be measured photometrically at 575nm.	KonelabAquaChemLabmedics Method No. ALLU001. Standard Methods for the Examination of Water and Wastewater. Part 3111 B – 21stEdition, 2005 APHA, AWWA, WEFT	3µg/l	Not Accredited

DETS 2125	Colour in Water	A filtered (true colour) or unfiltered (apparent colour) sample is analysed on a UV / Visible Spectrometer at 455nm and the result compared against a PtCo Calibration.	HACH - Water Analysis Handbook – Method 8025 Color, True and Apparent. APHA – Standard Methods for the Examination of Water & Wastewater 2005 - 2120 COLOR	1mg/l	Not Accredited
DETS 2126	Methylene Blue Active Substances	Methylene Blue is much more readily soluble in water than in chloroform, however in the presence of anionic surfactants an ion-pair is formed which is readily extracted into chloroform. The sample is mixed with chloroform and methylene blue solution in a separating funnel. The resultant colour change in the chloroform layer is measured on a spectrophotometer at a wavelength of 654nm.	Koga, Yamamichi, Nomoto et al. Analytical Sciences 15, 563-568 (1999)	0.01mg/l	Not Accredited
DETS 2127	Acidity, Dissolved CO2 and Aggressive CO2 in Water	Samples requiring acidity or aggressive CO2 are first digested by heating the sample with sulphuric acid and hydrogen peroxide. Samples for acidity analysis are then titrated with sodium hydroxide to pH 8.3 for total acidity or to pH 3.7 for mineral acidity. For aggressive and dissolved CO2 samples are titrated with sodium hydroxide to pH 8.3. The aggressive or dissolved CO2 in the sample is then calculated from the titration result.	USEPA – Method 305.1 Acidity HMSO – The Determination of Alkalinity and Acidity in Water 1981	10mg/l	Not Accredited
DETS 2130	Cyanides & Monohydric Phenols by Skalar	Water samples are filtered through a 0.45µm syringe filter and solid samples are extracted with 1M caustic soda prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-001 w/r+P7, I295-002 w/r+P7, 293-902 w/r+P7, 497-001	Soils mg/kg: Total & Free CN=0.1, Thio=0.6, Phenol=0.3 Waters µg/L: Total CN=40, Free CN=20, Thio=20, Phenol=100	Soils: MCERTS Waters: UKAS
DETS 2131	Low Level Cyanides & Monohydric Phenols by SKALAR	Water samples are filtered through a 0.45µm syringe filter prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-003w/r - Free Cyanide, I295-004w/r - Total Cyanide, 497-001 - Phenol	Total CN=0.1µg/l Free CN=0.1µg/l Phenol=1.5µg/l	UKAS
DETS 2140	Sugar in Mixing Water for Cement	Waters are filtered prior to analysis to remove any particulates in suspension. The sugar in the filtrate reacts with phenol and sulphuric acid to produce a yellow-orange coloured complex. The resulting colour absorbance is measured at 490nm using a suitable visible spectrophotometer.	Colorimetric Method for Determination of Sugars and Related Substances. MICHEL DUBOIS, K. A. GILLES, J. K. HAMILTON, P. A. REBERS, and FRED SMITH - Division of Biochemistry, University of Minnesota, St. Paul, Minnesota.	10mg/l	Not Accredited
DETS 2141	Acid Base Accounting & Neutralisation Potential of Soils	Carbonate content and Sulphur content are first determined on the sample using the current DETS methods (DETS 2005 and DETS 5017 respectively). Hydrochloric acid is then added to the sample, the amount being based on the initial carbonate content of the sample. After 22 hours the pH of the sample is checked. If pH is above 2.5 a further addition of acid is made to bring the pH down to around 2.0. Sample is then left to stand for a further 2 hours. Excess acid is then titrated with sodium hydroxide solution, and from this result the neutralisation potential of the sample is calculated. The acid potential of the sample is calculated from the sulphur content of the sample. Further calculations can then be performed using these results to give the neutralisation potential ratio and net neutralisation potential.	BSIPD CEN/TR 16363:2012 Characterisation of Waste – Kinetic testing for assessing acid generation potential of sulphidic waste from extractive industries. BS EN 15875:2011 Characterisation of Waste – Static test for determination of acid potential and neutralisation potential of sulphidic waste.	None available	Not Accredited
DETS 2142	Acid Soluble Fluoride in Soils and Sludges	Samples are tested on an 'as received' basis, without drying and crushing, as fluoride is very volatile and may be lost during normal sample preparation procedures. Samples are treated with sulphuric acid and a mixture of sodium citrate and potassium chloride buffer solutions. The fluoride ions released are then measured potentiometrically using a fluoride ion selective electrode.	Fluoride in Waters, Effluents, Sludges, Plants and Soils 1982 (HMSO Publication ISBN 0117516627	1mg/kg	Not Accredited
DETS 2143	Partition Coefficient of Soil (Kd Value)	The sample to be tested is first equilibrated with water (or any other solvent of interest) by mixing for a set time period (usually 72 hours). A spiking solution containing the compound or element of interest is then added to give a known concentration in the sample and then mixed for a further 48 hours. Analysis is then performed on the spiked samples by a standard method for the compound of interest. An un-spiked portion of the sample is extracted and analysed at the same time and the Kd value is calculated from the results obtained.	Environment Agency Science Report SC020039/4 – Development of the partition coefficient (Kd) test method for use in environmental risk assessments	TBC	Not Accredited
DETS 2144	Baumann-Gully Acidity in Soils	The dried and crushed sample is treated with sodium acetate to produce acetic acid. The acid produced is titrated with standard sodium hydroxide solution to give an indication of the acidity potential of the sample.	BS EN 16502: 2014 – Test method for the determination of the degree of soil acidity according to Baumann-Gully	TBC	Not Accredited

DETSO 2201	Nitrite in Waters and Leachates by Colourimetric Analysis	Nitrite is determined colorimetrically using the Konelab60i autoanalyser. The nitrite colour reaction occurs at pH 2.0 to 2.5 by coupling diazotized Sulphanilamide with N-1-naphthyl-ethylenediamine. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Nitrite in Waters Iss No 2. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 354.1 Nitrite, spectrophotometric (Approved at 40 CFR Part 136, not approved at Part 141)	0.04mg/l (as N)	UKAS
DETSO 2202	Total Oxidised Nitrogen in Waters and Leachates by Colourimetric Analysis	Nitrate is reduced to nitrite by hydrazine under alkaline conditions. The total nitrite ions are then reacted with sulphanilamide and N-1-naphthylethylenediamine dihydrochloride under acidic conditions to form a reddish purple azo-dye. The absorbance of this compound is measured spectrophotometrically at 540 nm using the Konelab 60i autoanalyser.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B and Part 4500-NO3 H – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Total Oxidised Nitrogen. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 353.1 Nitrate, Nitrite Colorimetric Automated Hydrazine Reduction (Approved at 40 CFR Part 136, Not approved at Part 141)	0.7mg/l (as N)	UKAS
DETSO 2203	Hexavalent Chromium in Waters and Leachates by Colourimetric Analysis	Hexavalent Chromium is determined colorimetrically using the Konelab 60i autoanalyser. Hexavalent chromium reacts with diphenylcarbazide in acid solution and produces a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 3500-Cr – 21st Edition 2005 APHA, AWWA, WEF. USEPA 7196-A. Aquakem Method. Hexavalent Chromium	10µg/l	UKAS
DETSO 2204	Hexavalent Chromium in Soil by Colourimetric Analysis	Hexavalent Chromium is determined colorimetrically using the Konelab 60i or Smartchem 600 autoanalyser. Hexavalent chromium reacts with diphenylcarbazide in acid solution producing a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm	Aquakem Method. Hexavalent Chromium	1mg/kg	Not Accredited
DETSO 2205	Reactive & Total Phosphorus in Waters and Leachates by Colourimetric Analysis	Phosphate is determined colorimetrically using the Konelab 60i or Smartchem 600 autoanalyser. The orthophosphate ion reacts with ammonium molybdate and antimony potassium tartrate under acidic conditions to form a 12-molybdophosphoric acid complex. The complex is then reduced with ascorbic acid to form a blue heteropoly compound. The absorbance of this compound is measured spectrophotometrically at wavelength 880nm. The Konelab 60i analyses a series of manually prepared standards. An intermediate calibrator is diluted by the Smartchem 600 autoanalyser, to produce a series of standards. These standards are used to produce a calibration graph. Filtered samples are analysed and the phosphate content determined by comparison of the sample absorbance with the calibration graph. Samples for total phosphate analysis are digested by boiling with sulphuric acid and ammonium metavanadate, then analysed as above.	Standard Methods for the Examination of Water and Wastewater Part 4500-P E– 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method. Phosphate in Waters Issue 2	0.01mg/l	Reactive Phosphorus: UKAS Total Phosphorus: Not Accredited
DETSO 2207	Ammonia in Waters and Leachates by Colourimetric Analysis	NOTE THAT AMMONIA ANALYSIS IS PERFORMED IN TWO STAGES USING A HIGH-RANGE METHOD AND A LOW-RANGE METHOD. ALL SAMPLES ARE ANALYSED BY THE HIGH-LEVEL AMMONIA METHOD FIRST. SAMPLES THAT GIVE AN AMMONIA RESULT BELOW 2.5mg/l WILL AUTOMATICALLY BE ANALYSED BY THE INSTRUMENT USING THE LOW-LEVEL AMMONIA METHOD. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm and is related to the ammonia concentration by means of a calibration curve. The Konelab 60i analyses a series of manually prepared standards for low-range ammonia analysis and prepares a series of calibration standards from a single stock solution for high-range analysis. The Smartchem 600 single stock solutions to prepare standards for both analysis ranges. These standards are used to produce a calibration graph. The ammonia content in the analysed samples is determined by comparison of the sample absorbance with the calibration graph.	Methods for the Examination of Waters and Associated Materials Ammonia in Waters 1981 ISBN 0117516139. Aquakem Method. Ammonia in Waters Issue 2	0.015mg/l	UKAS
DETSO 2208	Sulphide in Waters and Leachates by Colourimetric Analysis	Sulphide is determined colorimetrically using the Konelab60i autoanalyser. Potassium Dichromate converts N-N-Diethyl-p-phenylenediamine to the free radical which reacts rapidly with sulphide to produce the coloured 'DPD Blue' or 'Ethylene Blue'. The absorbance can then be measured at wavelength 660nm.	The determination of sulphide in waters and associated materials (2007) - SCA - Draft (March 2007). Aquakem Method. Sulphide SP001 Issue 2. Standard Methods for the Examination of Water and Wastewater, 21st Edition 2005, Part 4500. ISBN0-87553-223-3	10µg/l	UKAS

DETS 2210	Ferrous Iron in Waters and Leachates by Colourimetric Analysis	Three molecules of phenanthroline chelate with each atom of ferrous iron to form an orange/red complex. The intensity of the coloured solution is stable between pH3 to pH9. Rapid colour development occurs between pH2.9 and pH3.5 in the presence of excess phenanthroline. The resulting colour absorbance is measured at 510nm	Aquakem Method Ferrous Iron FIR001 Issue 2	0.1mg/l	Not Accredited
DETS 2211	Silicate in Waters and Leachates by Colourimetric Analysis	Reactive forms of silicon in acid solution, below pH2, react with ammonium molybdate ions to form a yellow silicomolybdate. Ascorbic acid reduces the yellow silicomolybdate to produce a blue silicomolybdate complex. Oxalic acid is added to destroy any molybdophosphoric acid formed.	ASTM D7126 - 10 Standard Test Method for On-Line Colorimetric Measurement of Silica. Aquakem Method Silica SIL Issue 2	0.25mg/l	Not Accredited
DETS 2212	Chloride Content of Waters and Leachates by Colourimetric Analysis	Chloride reacts with mercury (II) thiocyanate to form a soluble non-ionic compound. The thiocyanate ions released react in acid solution with iron (III) nitrate to form a red/brown iron (III) thiocyanate complex. The resulting intensity of the stable colour produced is measured spectrophotometrically at a wavelength of 480nm and is related to the chloride concentration by means of a calibration curve.	EPA Method 325.1 Chloride Colorimetric, Automated Ferricyanide, Automated Analyzer I	10mg/l	Not Accredited
DETS 2301	Metals in Soil by ICP-OES As, Ba, Be, Cd, Cr, Co, Cu, Fe, Mn, Mo, Ni, Pb, Se, V, Zn	Metals in soils and associated materials are extracted by boiling in a mixture of hydrochloric and nitric acids. The metal concentrations in the sample extract are determined by inductively coupled plasma optical emission spectroscopy (ICP-OES).	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005, AWWA, WEF	mg/kg: As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	UKAS (all listed) MCERTS (All soils listed except Fe)
DETS 2303	Total Hardness (By Calculation)	The concentrations of calcium and magnesium are determined by following the procedures given in DETSC 2306 - Metals in Waters By ICP-MS. The hardness is calculated from the results obtained.	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005 APHA, AWWA, WEF	n/a	UKAS
DETS 2304	Zinc Equivalent in Soil (By Calculation)	The concentrations of copper, nickel and zinc concentrations are determined using the appropriate methodologies. The zinc equivalent is a measure of the combined toxicity of the three metals, relative to the toxicity of zinc.	In-house Method	n/a	Not Accredited
DETS 2306	Metals in Waters by ICP-MS Ag, Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sn, V, Zn	Concentrations of metals in water are determined by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS). Any metals not listed can be determined but are not accredited under UKAS.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEF	High Level µg/l: Ag=0.13, Al=10.0, As=0.16, Ba=0.26, Ca=90, Cd=0.03, Co=0.16, Cr=0.25, Cu=0.40, Fe=5.50, Hg=0.01, K=80, Mg=20, Mn=0.22, Mo=1.1, Na=70, Ni=0.50, P=18.0, Pb=0.09, Sb=0.17, Se=0.25, Sn=0.40, V=0.60, Zn=1.3 Low Level µg/l Al=10.0, Cd=0.02, Cr=0.25, Cu=0.21, Fe=6.50, Ni=0.31, P=3.0, Pb=0.09, Zn=0.50	High Level Dissolved: UKAS (all listed except Mo, Sn) High Level Total: Not Accredited Low Level Dissolved: UKAS (Al, Cd, Cr, Cu, Fe, Ni, Pb, Zn) Low Level Total: UKAS (Al, Cd, Cr, Cu, Fe, Ni, P, Pb, Zn)
DETS 2307	Boron, Sulphur and Tin Content of Waters and Leachates by ICP-OES	Filtered water and leachate samples are analysed for boron, sulphur and tin content by ICP-OES. The wavelengths used for the determination are 249.772nm for boron, 181.972nm for sulphur and 189.925nm for tin.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEFT	Boron: 5µg/l Tin: 17µg/l Sulphur: 0.65mg/l	Not Accredited
DETS 2308	Copper, Nickel and Zinc Content of Topsoil	Dried and crushed soil samples are digested on a temperature controlled hotblock with hydrogen peroxide and nitric acid. The digested sample is then filtered and made up to a set volume before analysis for copper, nickel and zinc by ICP-OES.	BS 3882 – Specification for Topsoil	Copper: 0.40mg/kg Nickel: 0.65mg/kg Zinc: 0.65mg/kg	Not Accredited
DETS 2309	Extractable Magnesium and Potassium in Soil by ICP-OES	Extractable metals in soil are extracted by shaking the soil in 1M Ammonium Nitrate for 30 minutes. The concentration of each metal extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited
DETS 2310	Extractable Phosphorus in Soil by ICP-MS	Extractable phosphorus in soil is extracted by shaking the soil in 0.5M Sodium Hydrogen Carbonate for 30 minutes. The concentration of phosphorus extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited

DETS 2311	Water Soluble Boron in Soil by ICP-OES	The sample is mixed with boiling water and then heated on a hotblock for 20 minutes. The sample is then filtered to remove the solid materials and then analysed for boron by ICP-OES at a wavelength of 249.772nm.	The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	0.20mg/kg	Not Accredited
DETS 2312	Metals in Oils by ICP-OES	The sample is first oxidised using potassium permanganate and sulphuric acid. The oxidised sample is then digested in aqua regia on a hotplate, followed by analysis of the extract by ICP-OES.	US EPA Method 3031 – Acid Digest of Oils for Metals Analysis	mg/kg: As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	Not Accredited
DETS 2320	Total Sulphur in Soil and Aggregate by ICP-OES	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H ₂ S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. Aggregate analysis is not comparable to BS EN 1744.	TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	UKAS (Soils) Not Accredited (Aggregates)
DETS 2321	Total Sulphate Content of Soil and Aggregate by ICP-OES	The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3: 1990 Method 5. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	MCERTS(Soils) Not Accredited (Aggregates)
DETS 2322	Total Potential Sulfate and Total Oxidisable Sulphur (By Calculation)	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H ₂ S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The wavelength used for identification and quantification of sulphate is 181.972nm. The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelength used for identification and quantification of sulphate is 181.972nm. The two results obtained from the above tests may then be combined to calculate the Total Potential Sulphate and Total Oxidisable Sulphur content	BS1377 : Part 3: 1990 Method 5. BS1377 : Part 1 : 1990	0.01%	Not Accredited
DETS 2324	Mercury in Waters by Atomic Fluorescence Spectroscopy	Waters and aqueous samples are preserved by fixing with concentrated nitric acid. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry. For low level analysis, samples are filtered for dissolved mercury, but left un-filtered for total mercury. Samples are then digested with hydrochloric acid and bromide solution before analysing as above.	Standard Methods for the Examination of Water and Wastewater Part 3112 B – 21st Edition 2005 APHA, AWWA, WEF. PSA Method – Millennium Merlin Method for Total Mercury in Drinking, Surface, Ground, Industrial and Domestic Wastewaters and Saline Waters. USEPA Method 1631 – Determination of Low Level Mercury in Water	0.05µg/l 1.00ng/l (low level)	UKAS (Low level ONLY)
DETS 2325	Mercury in Soil Atomic Fluorescence Spectroscopy	The mercury is extracted from soil in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments	0.05 mg/kg	MCERTS(Soils)
DETS 2332 (DRAFT)	Inorganic and Methyl Mercury Speciation	Soils are air-dried and crushed before being subjected to hotblock extraction. Waters and aqueous samples are filtered to remove particulates. An aliquot is treated with bromate-bromide and tin (II) chloride to generate mercury and the mercury is determined by atomic fluorescence spectroscopy.	In-house Method	Soil: 100µg/kg Water: 1µg/l	Not Accredited
DETS 2333	Elemental Mercury Speciation	Soils, waters and aqueous samples are tested on an as-received bases. A known quantity of sample is extracted using argon and the released elemental mercury is trapped. The trapped mercury is released upon heating in a scarifier module and determined by atomic fluorescence spectroscopy.	In-house Method	Soil: 0.6µg/kg Water: 1µg/l	Not Accredited
DETS 2400	Unified Barge Bioaccessible Metals in Soils	The Unified BARGE Method (UBM) is an in vitro method for simulating the human digestive system. Synthetic digestive fluids are used to simulate the fluids present in the body. Both inorganic solutions (Containing inorganic salts such as KCl, NaCl etc), and organic solutions (Containing organic compounds such as Urea, Glucose etc) are mixed with enzymes to produce 4 Synthetic digestive fluids saliva (S), Gastric fluid (G), duodenal fluid (D) and bile (B). These solutions are then used to mimic the effect of a sample passing through a human gastro intestinal tract by shaking portions of the sample at 37°C, human body temperature (17.4).	EPA 9200.2-86 April 2012- Standard Operating Procedure for an In Vitro Bioaccessibility Assay for Lead in Soil. BGS Chemical & Biological Hazards Programme Open Report OR/07/027 - Inter-laboratory Trial of a Unified Bioaccessibility Procedure	V = 1.0mg/kg, Cr = 5.0mg/kg, Co = 1.0mg/kg, Ni = 5.0mg/kg, As = 0.5mg/kg, Se = 0.5mg/kg, Cd = 0.5mg/kg, Pb = 1.0mg/kg	Not Accredited

DETSO 2501	Leachate Preparation by Up-Flow Percolation	The sample to be tested is compacted into a 5cm diameter column. A continuous vertical up-flow of water is then pumped through the sample and the resulting leachate is collected, changing the collection vessel every 24 hours. The leachates are then analysed using existing test methods for the components requested by the client.	Draft British Standard BS EN 14405 – Characterisation of Waste – Leaching Behaviour Test- Up- Flow Percolation Test	n/a	Not Accredited
DETSO 2502	Particle Size Distribution of Topsoils	Samples to be analysed are first air dried at 28±2°C. The dried sample is passed through sieves of 50, 20 and 2mm pore sizes. The portion of the sample passing the 2mm sieve is mixed with a dispersant solution to assist in breaking down any soil aggregates into the component sand/clay/silt particles. The sample is then wet-sieved through a 63µm sieve. The portion of sample passing this final sieve is allowed to settle out and separate into clay and silt fractions. From the weights of sample retained on each sieve and from the settled fractions, the proportions of cobbles, gravel, sand, silt and clay can be determined.	BS 7755 – Soil Quality; Section 5.4: Determination of particle size distribution in mineral soil material – Method by sieving and sedimentation BS 1377 – Soils for civil engineering purposes; Part 2: Classification tests Simplified Method for Soil Particle-Size determination to Accompany Soil-Quality Analyses – Kettler, Doran & Gilbert, American Journal of Soil Science May/June 2001	n/a	Not Accredited
DETSO 3001	Solvent Extractable Matter in Soil	Soil samples are extracted with a water-immiscible solvent and filtered to remove the water. The solvent is evaporated and the amount of extractable matter in the sample is determined gravimetrically.	In-house method based on: - Problems Arising from the Redevelopment of Gas Works and Similar Sites - AERE Harwell Laboratory 1981. Environmental Agency - The Determination of Material Extractable by Carbon Tetrachloride and of Certain Hydrocarbon Oil and Grease Components in sewage Sludge – 1978	40mg/kg	Not Accredited
DETSO 3002	Oil & Grease/Solvent Extractable Matter in Waters	A known volume of sample is acidified to pH<2 and extracted three times with an organic solvent, such as n-Hexane, in a separating funnel. The solvent is removed by evaporation and the amount of extractable matter in the sample is determined gravimetrically.	APHA 21st Edition, 2005 – Method 5520 B. Oil & Grease - Partition Gravimetric Method. USEPA Method 1664, Revision A: n-Hexane Extractable Material (HEM: Oil & Grease) and Silica Treated N-Hexane Extractable Material (SGT-HEM; Non Polar Material) by Extraction and Gravimetry.	1mg/l for 500ml sample	UKAS
DETSO 3049	Elemental Sulphur in Soils and Waters by HPLC	Soils are extracted in dichloromethane (DCM) by sonication. The elemental sulphur concentration is determined by high performance liquid chromatography (HPLC) with UV detection using a C ₁₈ (e.g. 250mm x 4.6mm) column and a mobile phase composed of 95% methanol and 5% water. Waters and aqueous extracts of soils are extracted using DCM in a separating funnel, filtered, and the concentration determined using HPLC.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis: Elemental Sulphur.	Soil: 0.75mg/kg Waters: 90ug/l	Soil: MCERTS Water: UKAS
DETSO 3072	Aliphatic / Aromatic TPH by GC-FID	Aliphatic and aromatic petroleum hydrocarbons (C ₁₀ -C ₃₅) are extracted from soil and water using n-Hexane. The fractions are separated by solid phase extraction using silica columns, whereby the aliphatic fraction is eluted first with n-Hexane and the aromatic portion is eluted second with dichloromethane. The total, aliphatic, and aromatic concentrations are determined by gas chromatography flame ionisation detection (GC-FID) using a capillary column and hydrogen as the carrier gas. The chromatographic data is further characterized by subdivision into approximate boiling point/carbon number ranges with respect to n-alkane retention time markers.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis: Draft TNRCC Method 1006	Soil mg/kg: AL10-12 =1.5, AL12-16 =1.2, AL16-21 =1.5, AL21-35 =3.4, AR10-12 =0.9, AR12-16 =0.5, AR16-21 =0.6, AR21-35 =1.4 Water: 1ug/l	Soil: MCERTS(C10-C35 only) Water: Not Accredited
DETSO 3301	PAH in Soil by GC-FID	Soils and associated materials are extracted in dichloromethane (DCM) using sonication. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m, 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.5 mg/kg each 1.6 mg/kg Total PAH	UKAS (16 PAH's only)
DETSO 3302	Hexane / Acetone Extracted PAH in Soil by GC-FID	Soils are extracted into hexane: acetone by shaking. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m; 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.1 mg/kg each 1.6 mg/kg Total PAH	Not Accredited
DETSO 3303	Polyaromatic Hydrocarbons in Soils by GC-MS	The PAHs in the soil sample are extracted into hexane: acetone by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision C, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	0.03 mg/kg each 0.10 mg/kg Total PAH	UKAS (All 16 PAH's) MCERTS (not Fluorene, Anthracene, Chrysene or Total)
DETSO 3304	Polyaromatic Hydrocarbons in Waters by GC-MS	The PAHs in the water sample are extracted into dichloromethane by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS). In-house method based on EPA Method 3510C- EPA Method 3510C, Revision 3, Separatory Funnel Liquid-Liquid Extraction	10 ng/l each	UKAS (16 PAH's only)

DETS 3311	Extractable Petroleum Hydrocarbons (EPH) in Soil, Ballast and Water	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid and aqueous matrices. This method uses a dichloromethane (DCM) extraction followed by quantification using gas chromatography/ flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10-C24), and "mineral oil range" (C24-C40).	USEPA Method 3550C – Ultrasonic Extraction. USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	Soil: 10 mg/kg Ballast: 10mg/kg Water: 10µg/l	Soil: MCERTS Water: UKAS
DETS 3312	Hexane Extractable Petroleum Hydrocarbons (HPH)	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid matrices. This method uses a hexane: acetone (9:4) extraction followed by quantification using gas chromatography/ flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10- C24) and "mineral oil range" (C24-C40).	USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	Soil: 5 mg/kg	Not Accredited
DETS 3321	BTEX, MTBE & PRO in Soils by Headspace GC-FID	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	0.01 mg/kg	MCERTS(Soils) Not accredited for PRO range (C5-10)
DETS 3322	BTEX, MTBE & PRO in Waters & Leachates by Headspace GC-FID	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	1 µg/l	UKAS
DETS 3401	PCBs in Soils by GC-MS	An as-received soil sample is extracted in Hexane:Acetone (1:2) using sonication methodology. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the instrument software.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	µg/kg PCB 28=1.25 PCB 52=1.12 PCB 101=1.32 PCB 118=1.43 PCB 153=2.08 PCB 138=1.35 PCB 180=1.42	MCERTS(Soils)
DETS 3402	Polychlorinated Biphenols in Waters by GC/MS	The water sample is extracted in DCM on a reciprocal shaker. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the GC-MS software using an internal standard.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	ng/l PCB 28=208, PCB 52=161, PCB 101=211, PCB 118+123=513, PCB 153=163, PCB 138=107, PCB 180=132, PCB 105=133, PCB 114=253, PCB 126=399, PCB 156=253, PCB 157=119, PCB 167=248, PCB 169=181, PCB 189=271, PCB 77=202, PCB 81=186.	UKAS
DETS 3421	Organotin Compounds in Soils and Waters by GCMS	Organotin compounds are extracted from soil and liquid samples by shaking with hexane. The extract is derivatised with tetraethyl borate before being analysed by GC MS with selected ion monitoring (SIM).	TBC	Soil: 0.2mg/kg Water: 1µg/l	Not Accredited
DETS 3431	Volatile Organic Compounds in Soils by Headspace GC-MS	The method covers the range of volatile organic compounds with boiling points up to 220°C. Soil samples in salty water are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	0.01mg/kg except: Chloroethane - 0.019mg/Kg Styrene - 0.025mg/Kg	UKAS
DETS 3432	Volatile Organic Compounds in Waters by Headspace GC-MS	The method covers the range of volatile organic compounds with boiling points up to 220°C. Water samples are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	1 ug/l except: DCM (27), 2,2-Dichloropropane (2), Bromochloromethane (4), Bromodichloromethane (4), m-p-Xylene (2), 1,3-Dichlorobenzene (2)	UKAS except: Trichlorofluoromethane, Methylene Chloride, 1,1,1-Trichloroethane,
DETS 3433	Semi-Volatile Organic Compounds in Soils by GCMS	The SVOCs in the soil sample are extracted into DCM: Acetone by shaking. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 0.1 mg/kg	UKAS

DETSC 3434	Semi-Volatile Organic Compounds and Pesticides in Waters by GCMS	The SVOCs in the water sample are extracted into DCM using a liquid liquid extraction. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 1mg/l	Not Accredited
DETSC 3447	Acid Herbicides in Soils by LCMSMS	Acid herbicides in the sample are extracted with formic acid fortified acetonitrile by shaking. Samples are centrifuged, extracts diluted with mobile phase and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard.	EPA Method 536 EPA Method 615 EPA Method 8151A	35ug/kg	UKAS
DETSC 3448	Acid Herbicides in Liquids by LCMSMS	Samples are filtered and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard	EPA Method 536 EPA Method 615 EPA Method 8151A	20ng/l	UKAS
DETSC 3451	Phenol and British Gas Phenols in Soils and Waters by GCMS	The phenols in the water sample are extracted by solid phase extraction. Phenol is eluted from the SPE column with DCM evaporated to dryness under nitrogen and re-dissolved in DCM. Soils and associated materials are extracted in dichloromethane: acetone using sonication.	TBC	Phenol Liquids 0.1ug/l Phenol Soils 0.01mg/kg British Gas Phenol Liquids 0.1ug/l British Gas Phenol Soils 0.5mg/kg	Not Accredited
DETSC 3501	Target Based Screening of Water Samples by GCMS	This method uses a target MS library that contains over 1000 compounds, including both volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) allowing rapid identification and reporting of organic pollutants in an extracted water sample. This is a semi-quant method. Some of the VVOCs elute either before, or underneath, the DCM solvent peak so can therefore not be identified.	Agilent note 5991-4127EN	0.1ug/l	Not Accredited
DETSC 3511	Whole Oil Interpretation	This method is designed to give an interpretation of the type of oil or the type of contamination of oil in solid and aqueous matrices. Neat oil samples, oil samples diluted in dichloromethane (DCM), DCM extract from soil samples, supernatant oil from liquid samples can be tested with method. A product or a solvent extract is directly injected onto a gas chromatograph and is analysed by temperature programmed capillary chromatography and flame ionisation detection (FID). The chromatogram obtained serves as a "fingerprint" of the sample components and allows the determination of the bulk characteristic of the sample. A sample of crude oil and a window definer standard are analysed daily to check the retention times of the n-alkanes and compare to those within the sample. The pattern produced in the sample chromatogram is best matched to a series of 'in-house' reference materials which have been analysed previously under the same GC-FID conditions.	TBC	n/a	Not Accredited
DETSC 5002	Ash & LOI Content of Solid Biomass & Solid Recovered Fuels	The ash and LOI content of the sample is determined gravimetrically. A known weight of the sample is placed in a prepared ash crucible and placed in a furnace. The furnace is heated to 550°C ±10°C where the temperature is maintained. Following combustion the crucible and sample are removed, cooled and reweighed.	BS EN 14775:2009. BS EN 15403:2011	0.10%	UKAS
DETSC 5003	Volatile Matter Content of Solid Biomass, Solid Recovered Fuels and Coal	A known weight of the sample produced for volatile matter determination is placed in a suitable crucible fitted with a lid. The crucible and sample is weighed and heated in a furnace with a limited air through put at a temperature of 900°C ±10°C for 7 minutes. The sample and crucible are re-weighed and the volatile matter content determined by difference.	BSEN15148:2009 – Solid Biofuels Determination of the Content of Volatile Matter. BS EN 15402:2011 - Solid Recovered Fuels - Determination of the Content of Volatile Matter	0.10%	UKAS (except Coal)
DETSC 5004	Total Moisture / Dry Solids Content of Solid Biomass & Solid Recovered Fuels & Coal	The sample produced for general analysis is placed into a suitable prepared and weighed tray and reweighed. The sample is dried at 105°C to constant weight and the total moisture / dry solids content is calculated from the reduction in weight.	BSEN 14774 Parts 1 & 2 2009. DD CEN/TS 15414 Parts 1 & 2: 2010	0.10%	UKAS (except Coal)
DETSC 5005	Analysis Moisture Content of Solid Biomass, Solid Recovered Fuels & Coal	The sample produced for total moisture determination in accordance with DETSC 5009 or DETSC 5010 is placed in a suitable pre-weighed tray and reweighed. The sample is then dried at 105°C ±2°C to constant weight and then weighed again. The analysis moisture content is calculated from the reduction in weight.	BS EN 14774-3 2009. BS EN 15414-3 2011. BS 1016-104.1 -1999. ISO 11722 – 1999	n/a	UKAS (except Coal)

DETSC 5007	Calorific Value of Solid Biomass, Solid Recovered Fuels & Coal	Calorific value of a material is determined in an Isoperbol calorimeter by burning it in pure oxygen in a combustion bomb. A known amount of sample is placed in a combustion bomb which is then pressurised to 30bar with oxygen. A calorimeter bucket is filled with a known amount of deionised water which is placed in the calorimeter and the bomb placed in the bucket. The system is allowed to equilibrate and the bomb fired by electrical connection. The difference in temperature of the water in the calorimeter bucket caused by the ignition of the material in the bomb is measured and the calorific value calculated	BS EN 14918: Solid biofuels – Determination of calorific value. BS EN 15400: Solid recovered fuels - Determination of calorific value	1MJ/kg	UKAS (except Coal)
DETSC 5008	Calorific Value of Soil	A known amount of sample material is burnt in a combustion bomb that is immersed in water in a calorimeter and the difference in the water temperature before and after ignition measured. The calorific value of the sample material is calculated making any necessary corrections for heat generation not associated with the combusting sample. A gelatine capsule will be required to assist combustion which is also corrected for in the final calculations.	BS 1016-105 1992. ISO 19208. ASTM 5865	1MJ/kg	UKAS
DETSC 5009	Sample Preparation of Solid Biomass & Solid Recovered Fuels	If analysis is required on the original material (i.e. Bulk Density) a sub-sample will be taken after initial mixing after which the sample is then reduced by cutting/chopping oversized pieces of material. The material is then mixed and subdivided by manual means during which process representative samples are taken for analysis i.e. total moisture. The remainder of the sample is dried and then reduced to <1mm and again mixed and subdivided to produce the sample for laboratory analysis.	BS EN 14780:2011. BS EN 15413:2011	n/a	Not Accredited
DETSC 5011	Calculation of Fixed Carbon Content of Coal, SRF and Solid Biomass Fuels	The total moisture, analysis moisture, ash and volatile matter content are determined by approved methods. The values obtained are deducted from 100 and this gives the fixed carbon value of the fuel.	DD CENT/S 15296:2006. BS 1016.100:1994. BS ISO 17246:2005	0.10%	Not Accredited
DETSC 5012	Determination of Biomass Content of SRF	A portion of the sample is mixed with sulphuric acid and allowed to stand for at least 16 hours. Hydrogen peroxide is then added, and the sample is left for an additional 5 hours. At the end of this period the unreacted acid and peroxide are diluted down with deionised water. The residue is filtered off using a glass fibre filter and washed with deionised water to remove any remaining acid or peroxide. The filter and residue are placed in a pre-weighed crucible and dried at 1050C. The filter is re-weighed after drying and the non-biomass residue determined. A correction for carbonate content is made by determining the ash content of the original sample. By performing a calorific value on the solid captured on the filter paper, the result can also be expressed as a percentage.	BS EN 15440 Solid recovered fuels - Methods for the determination of biomass content	n/a	UKAS
DETSC 5013	Determination Of Carbon, Hydrogen, Nitrogen & Oxygen In Solid Biomass, Solid Recovered Fuels & Coal	A known mass of sample is introduced into a high temperature combustion reactor and burnt in a stream of pure oxygen. The sample is broken down into its elemental components N2, CO2, and H2O. High performance copper wires absorb the excess oxygen not used for sample combustion. The gases are separated and analysed by infrared or thermal conductivity detectors, dependent on the instrument used. The oxygen content of the sample is determined by calculation from the results obtained for carbon, hydrogen and nitrogen.	BS EN 15104:2011 Solid biofuels - Determination of total content of carbon, hydrogen and nitrogen - Instrumental methods. BS EN 15407:2011 Solid recovered fuels - Methods for the determination of carbon (C), hydrogen (H) and nitrogen(N) content. BS EN 15296:2011 Solid biofuels - Conversion of analytical results from one basis to another	Carbon 0.10%, Nitrogen 0.30%, Hydrogen 0.30%, Oxygen 3.55%	UKAS (except Coal)
DETSC 5014	Metals in Coal, SRF and Biomass by ICP	Metals in coal, solid recovered fuel (SRF) and biomass samples are extracted by microwave using Hydrogen Peroxide (to oxidise and break down organic matter) and Aqua Regia (to dissolve the matrix and hold the metals in solution). Their concentrations are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS EN 15410 - Solid recovered fuels - Methods for the determination of the content of major elements (Al, Ca, Fe, K, Mg, Na, P, Si, Ti). BS EN 15411 - Solid recovered fuels - Methods for the determination of the content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Ti, V and Zn). BS EN 15290 - Solid biofuels - Determination of major elements - Al, Ca, Fe, Mg, P, K, Si, Na and Ti. BS EN 15297 - Solid biofuels - Determination of minor elements - As, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, V and Zn	0.1 mg/kg: As, Be, Cd, Co, Mn, Ni, P, Pb, Sb, Se, Sn, Ti, V, Zn 0.2mg/kg: Cr, Cu, Ti 0.5mg/kg: Mo 1mg/kg: Al, Fe, K, Mg 5mg/kg: Ca 10mg/kg: Ag, Ba, Rh, Sr, Te	UKAS (except Coal): Al, As (SRF only), Ca, Cd, Co, Cr, Cu, K, Mg, Mn, Na (SRF only), Ni, P, Pb, Se, Sn, Ti, V, Zn All other metals not accredited
DETSC 5015	Mercury in Coal, SRF and Biomass by Atomic Fluorescence Spectroscopy	The mercury is extracted from coal, SRF and biomass in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment of the resulting solution with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is then quantitatively detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments.	0.055mg/kg	UKAS (except Coal)
DETSC 5016	Total Sulphur Content Of Coal, SRF And Biomass	Sulphur compounds in SRF and biomass are extracted using aqua regia / hydrogen peroxide and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H2S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The use of hydrogen peroxide enhances the oxidation properties of nitric acid especially in the digestion of organics. Sulphur compounds in coal are determined by ICP-OES from the aqueous washings of the combustion products after firing in a bomb calorimeter.	TRL Report TRL447 (Updated) - Sulphate specification for structural backfills 2005	0.001mg/kg	UKAS (Except Coal)

DETS 5017	Sulphur, Chlorine, Fluorine & Bromine Content of Solid Biomass, Solid Recovered Fuels and Coal by IC	A known weight of fuel is burnt in a pressurised bomb in pure oxygen. After firing of the bomb, it is stood for a minimum of five minutes to allow the combustion products to settle then the oxygen is slowly released over a period of at least three minutes. The bomb is then taken apart and the bomb electrodes rinsed with deionised water into the inside of the bomb. These washings are then decanted into a 50ml volumetric flask. The inside of the bomb is rinsed with deionised water and the washings added to those in the volumetric flask. The contents of the volumetric flask are made up to volume with deionised water and stored for the analysis of sulphur, chloride, fluoride and bromide by ion chromatography.	Operating Instruction Manual No. 442M 6200 Parr Oxygen Bomb Calorimeter. Operating Instruction Manual No. 205M 1108 Oxygen Combustion Bomb. Operating Instruction Manual No. 454M 6510 Water Handling System	0.01% Chlorine, 0.01% Fluorine, 0.01% Bromine, 0.04% Sulphur (Coal only)	UKAS (Except Coal and Br)
DETS 5018	XRF Analysis of Coal, Biomass, SRF and Cement	When X-rays are targeted at a material they will cause electrons to be ejected from the component atoms (ionisation). The ejection of electrons will cause the electronic structure of the component atoms to become unstable resulting in electrons from the higher energy outer orbitals "falling" into the inner orbitals to compensate. This causes a release of energy in the form of a photon equal to the energy difference between the two orbitals involved. Thus the material emits radiation which has energy characteristics of the atoms present. In energy dispersive X-ray fluorescence the fluorescent X-rays emitted are directed to a detector from which the data is processed by a multichannel analyser, producing a digital spectrum which is processed to obtain analytical data. The instrumental analytical parameters are set up for the matrix type. A sample cell is prepared by placing a piece of prolene film over the outer cell and then inserting the inner cell. This gives a complete cell with a clear prolene base. A portion of the sample is placed into the cell and then analysed.	Rigaku NEX CG EDXRF instruction manual	Cement: 0.01% BaO, Cr ₂ O ₃ , CuO, PbO, Rb ₂ O, SrO, ZnO 0.02% Cl, V ₂ O ₅ 0.05% TiO ₂ 0.1% Mn ₂ O ₇ , P ₂ O ₅ , SO ₃ 0.5% K ₂ O 1% Al ₂ O ₃ , CaO, CdO, Co ₂ O ₃ , Fe ₂ O ₃ , MgO, Na ₂ O, NiO, SiO ₂ , Y ₂ O ₃ Fuel: 0.01% Co, Cr, Cu, I, Li, Mn, Ni, P, Pb, Sn, Ti, V, Zn 0.02% Al, Ba, S, Si 0.1% Mg 0.2% Ca 0.5% As, Cd, Hg, Mo, Na, Sb, Se, Th, Tl 1% Ag	Not Accredited
DETS 5019	Determination of Biodegradable Municipal Waste Content (Compositional Analysis)	The method is based on handpicking the BMW fraction from the municipal waste sample, and then weighing the amount of BMW sorted and expressing this as a percentage on a wet weight basis of the weight of the whole municipal waste sample.	ENVIRONMENT AGENCY: Guidance on monitoring of MBT and other treatment processes for the landfill allowances schemes (LATS and LAS) for England and Wales	n/a	Not Accredited
DETS 5020	Determination of Bulk Density in Solid Biomass and Solid Recovered Fuels	The test portion is filled into a standard container of a given size and shape and weighed afterwards. Bulk density is calculated from the net weight per standard volume and reported for the moisture content.	BS EN 15103:2009 Solid Biofuels- Determination of bulk density DD CEN/TS 15401:2010 Solid Recovered Fuels- Determination of bulk density	0.5kg/m ³	Not Accredited
DETS 5021	Auto Ignition Temperature	A quantity of the sample is placed into a metal tray or crucible and placed into an oven or furnace. The temperature of the oven / furnace is increased in predefined increments and the temperature in which the sample ignites is noted.	None	25°C	Not Accredited
DETS 5022	LOI Content of Fines	The sample is dried to constant weight and its particle size reduced to <2mm. The LOI content of the sample is then determined gravimetrically. A known weight of the prepared sample is placed in a crucible and placed in a furnace. The furnace is heated to set temperature and following combustion the crucible and sample are removed, cooled and reweighed.	The Landfill Tax (Qualifying Material) Order 2011	0.10%	Not Accredited
DETS 5023	Crude Fibre	The sample after defatting is sequentially treated with boiling dilute sulphuric acid, and with boiling potassium hydroxide solution. The loss in mass resulting from incineration corresponds to the mass of crude fibre.	FAO - Quality Assurance for Animal Feed Analysis Laboratories – Part II Analysis Section	1%	Not Accredited
DETS 5024	Void Space	Water is added to a known volume of biofilter media until it fills all the void spaces and percentage voids is calculated.	https://www.sdstate.edu/abe/faculty/upload/Determining-Pressure-Drop-through-Compost-No-014080.pdf	0.1%	Not Accredited
DETS 5025	Theoretical Biogas Potential	The Baserga equation determines how much biogas a feedstock may theoretically produce based on nutrient content.	An Analysis of Available Mathematical Models for Anaerobic Digestion of Organic Substances for Production of Biogas. Mandy Gerber, Chair of Thermodynamics, Germany, International Gas Union Research Conference, 2008. Biogas: Calculation of Gas Yield of co-substrates	0.1% Total Methane 1m ³ /tonne Yield	Not Accredited
DETS 5026	Determination of Particle Size Distribution	A sample is subjected to sieving through horizontally oscillating sieves, sorting the particles in decreasing size classes either manually or by machine sieving. For particles less than 25mm, only machine sieving is used, for particles greater than 25mm, manual or machine sieving is applied.	BS EN 15415-1 – Solid recovered fuels - Determination of particle size distribution BS EN 15149-2 – Solid biofuels - Determination of particle size distribution	n/a	Not Accredited

DETSC 5027	Flammability Potential Screening Analysis	<p>The method is split into three parts which can be ran independently of each other:</p> <ul style="list-style-type: none"> • exposure to heat and flame • exposure to a spark source • exposure to heat and a spark source (flash point) <p>Exposure to heat and flame: the as-received sample is exposed to heat and flame. Observations are used to report if the sample has a negative or positive flammability potential.</p> <p>Exposure to a spark source: the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and observations made to report if the sample has a negative or positive flammability potential.</p> <p>Exposure to heat and a spark source (flash point): the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and if the sample flashes, the temperature is reported. The analysis is repeated at 5°C intervals until the vapour flashes or the temperature of 100°C is reached.</p>	ASTM D4982-12: Standard Test method for Flammability Potential Screening Analysis of Waste	n/a	Not Accredited
DETSC 5028	Determination of Length and Diameter of Pellets	<p>The length and diameter of fuel pellets of a representative sample of fuel pellets are measured by using a calliper. The length of a pellet is always measured along the axis of the cylinder. The diameter is measured perpendicular to the axis.</p>	BS EN 16127 – Solid biofuels - Determination of length and diameter of pellets	n/a	Not Accredited

**Archaeology Monitoring Report
(Tested Externally)**





GI MONITORING REPORT

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A66 NTP BOWES TO SCOTCH CORNER GEOTECHNICAL INVESTIGATIONS ARCHAEOLOGICAL MONITORING REPORT

prepared for
Allied Exploration and Geotechnics
Ltd

on behalf of
Amey

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A66 NTP BOWES TO SCOTCH CORNER GEOTECHNICAL INVESTIGATIONS ARCHAEOLOGICAL MONITORING REPORT

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A66 NTP BOWES TO SCOTCH CORNER GEOTECHNICAL INVESTIGATIONS

ARCHAEOLOGICAL MONITORING REPORT

Summary

NAA conducted a scheme of archaeological monitoring in conjunction with Ground Investigation (GI) works along the eastern stretch of the A66, from Bowes to Scotch Corner, as part of an assessment to inform proposed upgrades to the existing carriageway.

The route of the A66 passes through a corridor of significant Roman archaeology, intersecting the Scheduled Monument of Carkin Moor Roman Fort and close to further scheduled forts at Greta Bridge and Bowes. Excavations in recent years have highlighted substantial Iron Age and early Roman occupation at Scotch Corner (Fell 2020, NAA 2020) as well as a Roman roadside settlement to the west of Carkin Moor (NAA in prep.) and have demonstrated that widening of the existing routeway has the potential to encounter considerable archaeological remains dating from the early Prehistoric through to the post-medieval period (Zant and Howard-Davis 2013).

In total, 74 GI interventions were monitored during the current scheme. Most of the archaeological remains were recorded across the area from Stephen Bank to Carkin Moor in the east, within four trial pits. In addition, an impressive suite of ridge and furrow was encountered near Bowes.

Two potential stone trackways were recorded in the vicinity of Carkin Moor. The first, in trial pit (TP) SBC041 had a surface constructed entirely of angular sandstone slabs, while the second in TP SBC042, appeared to have a kerb of large stones flanking a metalled surface, potentially constructed atop an earlier hollow-way. Only the edges of the features were revealed in their respective trial pits and no finds were recovered; however, they both appeared to run along a north-east to south-west alignment, perpendicular to the route of the A66 and, significantly, both were recorded in an area of known Roman archaeology. The potential trackway in TP SBC042 was located directly to the south of the roadside settlement excavated in 2016 (NAA in prep.).

The remaining archaeological features were encountered to the west, in the vicinity of West Layton. In a field directly to the south-west of West Layton Manor, TP SBC012 exposed a cobble foundation for an earthen bank or hedgerow, that probably defined an east-to-west field boundary parallel to the old Roman Road. To the east, two irregular-shaped pits containing charcoal and burnt daub were excavated in TP SBC018. They potentially belonged to a larger pit grouping or structure that was near a kiln or hearth, from which the burnt material likely originated, and which could still survive in the surrounding field.

Although none of the archaeological features contained diagnostic finds, the presence of remains confirms the potential archaeological significance of the stretch of road from Stephen Bank to Carkin Moor, highlighted in earlier work. Despite negative results within the GI interventions, the significance of the remainder of the proposed route cannot be discounted owing to the prevalence of known historic sites along its alignment that include a large number of listed buildings and scheduled monuments.

1.0 INTRODUCTION

- 1.1 Amey was commissioned by Highways England to undertake the Project Control Framework (PCF) Stage 3 design and assessment of proposed upgrades to the A66 between Junction 40 of the M6 at Penrith and the A1(M) at Scotch Corner. As part of the assessment programme, Ground Investigation (GI) works were carried out along parts of the proposed scheme. This report presents the results of a programme of archaeological monitoring during GI works in four areas along the eastern part of the A66 route between Bowes and Scotch Corner (NGR: c.NY 9865 1350 to c.NZ 2165 0525; Fig. 1).
- 1.2 The report has been produced by Northern Archaeological Associates (NAA) for Allied Exploration and Geotechnics Ltd, on behalf of Amey. The results of the work will be used to inform the Stage 3 Cultural Heritage Assessment for the project (NAA in prep.).

2.0 LOCATION, GEOLOGY AND TOPOGRAPHY

Location

- 2.1 Groundworks were proposed in four separate areas along the A66 route (Fig. 1), although monitoring was ultimately not required at the eastern section around Scotch Corner. The monitored sections comprised: a c.2.6km stretch where the current A66 passes to the north of Bowes village (Bowes Bypass section, 14 trial pits); a c.3.3km stretch to the south of Barnard Castle between Cross Lanes and Rokeby (17 trial pits); and c.5km between New Road (to the south of Hutton Magna) and Carkin Moor (Stephen Bank to Carkin Moor section, 43 trial pits).

Geology

- 2.2 In the area of the proposed works at Bowes, the solid geology is primarily mudstones, siltstones and sandstones of the Stainmore formation, although immediately to the east of the village the route crosses an area of Carboniferous limestone (part of the Great Limestone Member formation). The second area, Cross Lanes to Greta Bridge, overlies the same Carboniferous limestone. In the area of Carkin Moor and extending east to Scotch Corner, the solid geology consists of limestone and sandstone of the Alston Formation. In all three areas the bedrock is covered by superficial deposits of Devensian Diamicton Till (BGS 2021).

Topography and land use

- 2.3 The majority of the trial pits were excavated on farmland within arable fields or those set to pasture. Two trial pits were excavated along the line of the South Durham and Lancashire Union Railway near Bowes.

3.0 SUMMARY ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

- 3.1 There have been surprisingly few prehistoric sites identified along the Scotch Corner to Bowes section of the A66. However, investigations during previous upgrading of the road from Carkin Moor to Scotch Corner identified a scatter of sites of Late Mesolithic/Early Neolithic to Iron Age date (Zant and Howard-Davis 2013).
- 3.2 Known archaeological remains directly relevant to the current works date almost entirely to the Roman period. For much of the route between Scotch Corner and Bowes, the A66 closely follows the line of the Roman road running westwards from Dere Street (the modern A1(M)) towards the Stainmore Pass, which passes the Pennines *en route* to Carlisle (Margary road 82 (Margary 1973, 433–6).
- 3.3 The Roman road junction at Scotch Corner was the site of a substantial Late Iron Age and early Roman settlement, part of which was excavated and surveyed during recent A1 improvements (Fell 2020). Although the site has not yet been granted statutory designation, the archaeological remains are considered by Historic England to be of at least national, and probably international, significance.
- 3.4 Military installations were spaced along the Roman road. Passing westwards from Scotch Corner, the A66 bisects the scheduled Roman fort and prehistoric or Romano-British enclosed settlement 400m west of Carkin Moor Farm (National Heritage List No. 1015418; Zant and Howard-Davis 2013). In 2016, during construction of a water pipeline at the southern side of the A66 immediately to the west of Carkin Moor Roman fort, excavations identified extensive remains of a Roman roadside settlement extending westwards towards Mainsgill Bridge on the south side of the Roman road (NAA 2016 and in prep.). Finds included elements of the Roman Road, seven roadside enclosures (two of which had been walled), cobbled surfaces, the footings of a possible building, refuse dumps and a pottery kiln.
- 3.5 To the west, the route passes a probable Roman camp at Rokeby Park and the scheduled Roman Fort and vicus at Greta Bridge (National Heritage List No. 1019074). At Bowes there lies another scheduled Roman fort (*Lavatrae*), part of which was reused as a

medieval castle (National Heritage List Nos 1002316 and 1002318; Frere and Fitts 2009). The modern A66 bypasses the village to the north, although the Roman road passes through the modern settlement, which is built over the vicus associated with the fort.

- 3.6 Detailed comparison of the proposed trial-pit locations against other known archaeological evidence suggested that the GI works would have no impact upon them. However, there was still the possibility of encountering previously unknown archaeological features and deposits. The potential presence of previously undetected prehistoric evidence has been noted above. The modern A66 does not, in all areas, precisely follow the alignment of the Roman road (where it is known) and the recent excavations to the west of the Carkin Moor fort have demonstrated that remains of the Roman route can survive below the modern verge or within adjacent fields. Peripheral features such as Roman quarry pits (for road materials) have been recognised further to the west, and may also be present on the current part of the route, while some Roman roads may have been flanked at a distance by parallel boundaries as has been recognised on the route leading northwards from Bowes to Barnard Castle (Margary road 82 (Margary 1973, 437); Ambrey *et al.* 2017, 105–6).
- 3.7 None of the trial-pit locations impacted directly upon any recorded sites of medieval or post-medieval significance.

Geophysical survey

- 3.8 Geophysical survey was conducted in advance of the current work (Headland Archaeology unpublished) in addition to an extensive survey of the route between Scotch Corner and Greta Bridge carried out as part of the earlier widening along the A66 (GeoQuest Associates 1999).

4.0 AIMS AND OBJECTIVES

- 4.1 The aim of the archaeological monitoring was to identify the presence and location of archaeological remains within the area of development. The objectives of the monitoring were to:
- establish the presence, nature, extent, preservation and significance of any archaeological remains within the area of the proposed road improvements;
 - provide a detailed record of any such archaeological remains;

- recover and assess any associated structural, artefactual and environmental evidence, where safe to do so;
- undertake a programme of investigation that meets with national and regional standards (Historic England 2015a; ClfA 2014b–d; South Yorkshire Archaeology Service 2018); and
- prepare an illustrated report on the results of the archaeological monitoring to be deposited with Durham County Council Historic Environment Record (HER).

5.0 METHODOLOGY

- 5.1 The trial pits were excavated down to natural geology or archaeological deposits using a tracked excavator fitted with a toothless bucket and measured 2m by 2.5–4m. Borehole starter pits were excavated by hand. Where structures, features, deposits or finds of archaeological interest were exposed, mechanical excavation ceased to allow the investigating archaeologist to assess and record the remains. Once archaeological observations were complete, the monitoring archaeologist allowed mechanical operations to recommence. A toothed bucket was used to excavate the trial pit down to the specified depth, which varied between 3m and 6m.
- 5.2 Where archaeological features extended beyond the limits of the trial pits, as in TP SBC12, TP SBC41 and TP SBC42, the exposed remains were cleaned and recorded and the pit moved. In this way, the presence of archaeology was noted and an interpretation made, but it is possible to preserve the remains in situ until full excavation of the features can be undertaken.
- 5.3 Archaeological designations for each intervention conform to those used by the GI contractors (AEG). A full record (written, graphic and photographic, as appropriate) was made for all work, using pro-forma record sheets and text descriptions appropriate to the work. The location of each intervention was surveyed by the GI contractors.
- 5.4 A photographic record of all contexts was taken in digital format and include a clearly visible, graduated metric scale where possible. A register of all photographs will be kept. The digital photographs will be submitted to the Archaeology Data Service (ADS) for long-term archive storage.
- 5.5 No finds of archaeological interest were recovered.

5.6 Upon discussion between the contractor and the monitoring archaeologist, it became clear the trial pits to be excavated at Scotch Corner were within areas of made ground previously subjected to archaeological excavation (Fell 2020), and therefore monitoring of these interventions was not required.

6.0 RESULTS

6.1 Monitoring of the GI works revealed very little archaeological evidence. The majority of trial pits did not contain archaeological features, deposits or finds; those that were present probably related to known nearby Roman-period settlement or post-medieval agricultural regimes.

6.2 Only the trial pits that revealed potential archaeological remains will be discussed in detail here. An inventory of archaeological contexts recorded is listed in Appendix A, while a tabulated inventory of all trial pits, their deposit depths and characteristics are listed in Appendix B.

TP BB006

6.3 The trial pit was located north of the A66, within the footprint of the old South Durham & Lancashire Union Railway cutting (Fig. 2).

6.4 Beneath a thin topsoil layer was revealed a 0.2m-thick layer of compacted stone and black cinders that is likely to have formed the bedding material for the rail tracks (12, Plate 1). The trackway material had been laid upon natural mid-brownish grey boulder clay, which turned increasingly grey and stony towards the base of the trial pit, at a depth of 4.5m.



Plate 1: TP BB006 through the Bowes railway cutting. Stone, clay and cinder deposit 12 can be seen at the southern edge of the pit.

TP BB008 and BB009

- 6.5 The trial pit was located to the north of the A66 in a field that contained large and prominent ridge and furrow, aligned north to south (Plate 2, Fig. 2).
- 6.6 The pit was excavated through a plough ridge, revealing it to be made up of a 0.45m-thick mixed plough-soil of mid-greyish brown silty clay and redeposited yellow natural clay (13). No finds were recovered to enable potential dating of the ridge-and-furrow earthworks. TP BB009 was located in the field directly to the east, which also contained large ridge and furrow earthworks, presumably of the same regimen. A comparable mixed plough-soil horizon was also recorded in this pit.



Plate 2: prominent ridge-and-furrow earthworks in the vicinity of TP BB008, looking south-east.

TP CLR007

- 6.7 The trial pit was located immediately north of the A66 in the vicinity of Cross Lanes (Fig. 3). Stripping of topsoil revealed a concentration of large stones (14) along the southern edge of the pit. The accumulation of stones perhaps related to field clearance and distribution along a boundary, but there was a possibility they could also be associated with the alignment of the Roman Road. No further exploration was conducted, and to avoid disturbing the remains further at this stage, the decision was made to move the pit c.0.7m to the north where no potential archaeological remains were present.

TP SBC012

- 6.8 The trial pit was located on the north side of the A66, to the south-east of West Layton Manor. The pit was situated in the south-eastern corner of a field set out to pasture, in proximity to its western, tree-lined boundary (Fig. 4).
- 6.9 Removal of a c.0.5m-thick turf and topsoil layer revealed the remnants of a cobble foundation (05) running roughly east to west at the southern end of the pit (Plate 3). Foundation 05 was a rubble construction of large, natural limestone cobbles and small,

sub-angular sandstone fragments within a matrix of grey clayey-silt, that could indicate that it was originally the foundation for an earthen bank. The rubble construction appeared to be sat directly atop the natural yellow clay, although it is possible that it could have been situated within a shallow construction cut. The width of **05** within the pit was 0.6m; however, it extended into the southern Limit of Excavation (L.O.E) and its full dimensions remain unknown. No earthworks were visible on the surface of the field to give any further indication of the extent or orientation of wall **05** and no finds were recovered during cleaning that could provide any dating evidence.

- 6.10 Aside from an initial surface clean for photographing, no further excavation of wall **05** was conducted. The trial pit was subsequently moved c.2m to the north to avoid any further disturbance to the in situ archaeological remains.



Plate 3: cobble wall foundation **05** in TP SBC012, looking south.

TP SBC018

- 6.11 The trial pit was located to the north of the A66, in an arable field opposite the junction with Waitlands Lane (Fig. 4).
- 6.12 Removal of a 0.5m-thick topsoil layer revealed the natural yellow clay into which were cut two irregular pits (**02**, **04**). Pit **02** was the smaller of the two, measuring 0.5m wide

by 0.12m in depth, with shallow sloping sides culminating in a flat but uneven base. It had been backfilled with a single deposit (**01**) of mid-brownish grey silty clay that contained patches of burnt orange clay and frequent flecks of charcoal. Pit **04** was located 0.6m east of **02** and was 0.6m wide by 0.13m deep. It displayed a similar shallow, irregular profile to pit **02** and had been backfilled with a comparable deposit of mid-brownish grey silty clay with burnt clay and charcoal inclusions (**03**). Neither pit demonstrated evidence of in situ burning, indicating the backfill material had been redeposited from elsewhere. No finds or diagnostic material was recovered from either feature to help ascertain a potential date or function.

- 6.13 Pits **02** and **04** were fully excavated and recorded before recommencement of the GI works.



Plate 4: pits **02** (top) and **04** (bottom) in TP SBC018.

TP SBC041

- 6.14 The trial pit was excavated into the roadside verge to the south of Warrener Lane, close to the junction with an unnamed lane leading to Pond Dale Farm (Fig. 5).

- 6.15 Removal of an initial thin (0.1m) layer of turf and topsoil and 0.4m of underlying subsoil revealed the edge of what appeared to be a sandstone trackway (**11**), running north-east to south-west at the eastern LOE of the pit.
- 6.16 The upper surface comprised medium to large, angular sandstone slabs of up to 0.5m in width, which appeared to be laid atop smaller and more irregular sandstone fragments within a matrix of mid-orange-brown silty clay. The western edge of **11** was defined by a series of orthostatic sandstone pieces. It was unclear whether the stonework had been situated within a cut or had merely sunk into the natural sandy clay. No further excavation was conducted. The trench was backfilled to preserve the archaeology in situ and the trial pit moved to the east to prevent further disturbance.



*Plate 5: overview of sandstone trackway **11** in TP SBC041.*

TP SBC042

- 6.17 The trial pit was located to the south of the A66 within an arable field to the east of Mainsgill Farm Shop and within the vicinity of the 2016 NAA excavations (Fig. 5, NAA 2016 and in prep.).

- 6.18 Removal of a 0.3m-thick topsoil layer exposed the natural yellow clay, which was cut at the north-eastern end of the pit by feature **06** (Plate 6). The feature was visible in plan over a span of 2.5m and extended into the eastern LOE of the pit. It had been infilled with a mid-greyish brown deposit of clayey silt (**09**), into which had slumped a layer of rounded and sub-angular sandstone fragments (**08**), of various widths up to a maximum of 0.4m. The larger stones were concentrated along the edge of cut **06**, indicating that the feature was potentially linear and ran along a north-north-east to south-south-west alignment. An area of smaller sandstone fragments (**10**) was recorded in the south-eastern corner of the pit and could represent the remnants of a metallised surface above deposit **09**.
- 6.19 Feature **06** was cleaned and recorded in plan but was not investigated or disturbed further, the trial pit being moved to the north-west where no archaeological remains were present. No diagnostic finds were recovered and without additional excavation, the form and function of **06** are unclear. However, the concentration of stone and apparent linear form suggests a trackway, potentially belonging to the Roman roadside settlement previously identified in excavations directly to the north (NAA 2016 and in prep.). The degree of slumping of stone deposit (**08**) along the edge of **06** could indicate that the cut is of fairly substantial depth and therefore belongs to an initial ditch or hollow-way that was later capped with a stone track.



Plate 6: feature **06** in TP SBC042, showing sandstone fragments (**08**) along the western edge and area of metalling to the south-east corner.

7.0 DISCUSSION

- 7.1 Only seven of the 74 trial pits excavated for Geotechnical Investigations exposed archaeological remains. This may be considered a surprisingly sparse result considering the historical importance of the trans-Pennine corridor and the prevalence of known archaeological sites distributed along the A66.
- 7.2 The majority of the trial pits were excavated in pasture or arable fields and in some places the plough horizon and resulting topsoil layer was in excess of 0.5m thick. This intensive cultivation resulting from post-medieval farming practices has potentially erased many shallower, negative archaeological features, as well as levelling any extant earthworks. Several trial pits were also located in the verge along the current A66, the construction of which would also likely have resulted in significant truncation to any archaeological remains in the corridor. However, the 2016 excavations to the west of Carkin Moor Roman Fort demonstrate that there are areas where the creation of the verge has helped to preserve archaeological remains beneath (NAA 2016 and in prep.).
- 7.3 Aside from ephemeral remnants of the 19th-century South Durham & Lancashire Union Railway in TP BB006 and the impressive ridge and furrow earthworks recorded to the west of Low Broats Farm (TP BB008/BB009, Plate 2), all further archaeological remains were encountered along the stretch from Stephen Bank to Carkin Moor. Unfortunately, no finds were recovered to date these features and the small footprint of the trial pits (2m wide by 2.5–4m in length) precluded confident interpretation.
- 7.4 Shallow pits **02** and **04** within TP SBC018 contained similar charcoal rich fills that indicated they had been backfilled contemporaneously. The fills included heat-affected clay, potentially burnt daub perhaps originating from a nearby kiln or hearth/oven. Without further excavation, it is unclear whether these features represent an isolated pit cluster or belong to a wider, potentially structural, group of features. The extensive truncation appears to preclude the survival of archaeological occupation horizons; however, there is the possibility that the bases of related features still survive in the surrounding field.
- 7.5 The remainder of the archaeological features encountered were apparently linear, each extending beyond the LOE of their respective trial pits, meaning their full forms and

extents were unclear, but enough of the features were visible to inform ideas about their functions. None of the features can be related to any documented previously on historic mapping of the area, implying that they could pre-date the mid-19th century.

- 7.6 Cobble and stone construction **05** in TP SBC012 probably provided a foundation for a wall or earthen bank or hedgerow that defined a former field boundary. It ran from east to west, roughly parallel to the line of the current A66 and perhaps reflected the line of the old routeway, still visible to the west.
- 7.7 Excavation of a Roman period roadside settlement along the southern verge of the A66 to the west of Mainsgill Farm (NAA 2016 and in prep.) revealed a series of partial enclosures set out perpendicular to the road. Located to the south of that excavation area, it is probable that feature **06** in TP SBC042 represents a trackway relating to the roadside settlement. The stonework on top of deposit **09** perhaps represented formalisation of an earlier hollow-way with an outer kerb (**08**) and metalled surface (**10**). Recent excavations of Pre-Roman and Roman settlement at Scotch Corner (Fell 2020; NAA 2020; Zant and Howard-Davis 2013) demonstrated that such trackways often defined the boundaries between distinct enclosures and often connected the areas of occupation with an agricultural hinterland beyond and this is likely the case with feature **06**.
- 7.8 A second potential trackway (**11**) was uncovered in TP SBC041. Like **06**, the upper surface was of large angular sandstone slabs, set upon a deposit of mid brown silty-clay that could represent the infill of an earlier hollow-way. There was also a possible kerb of on-edge sandstone blocks pressed into the lower deposit along the western edge. There was no evidence of a metalled surface and it is likely the entirety of the trackway surface was made up of angular sandstone slabs, the gaps being infilled with rubble. The south-western orientation of the track points directly towards Pond Dale Farm to the south and it is plausible that feature **11** was an original packhorse track leading to the farm when it was initially constructed.
- 7.9 There is also the possibility that feature **11** is much older and potentially Roman in date. Sandstone has been a favoured local building material from at least the 1st century AD due to its availability. It was used for walls, floors and road surfaces of early Roman date at Carkin Moor (NAA in prep.) and Scotch Corner (Fell 2020). It has been extensively quarried in the surrounding area up to the present day, with a large modern quarry still active along the A66 at Gatherley Moor. The location of the feature within a hinterland

of known Roman archaeology, directly to the north-west around the fort at Carkin Moor, is also a contributing factor, along with its orientation towards the main trans-Pennine thoroughfare of the Stainmore Pass to the north (Margary road 82; Margary 1973, 433–6).

- 7.10 The linear nature of features **5**, **6** and **11** means that there is potential for continuations of these features to be revealed and studied during future work when it may be possible to ascertain dates of construction and a more comprehensive interpretation of their functions and contexts.
- 7.11 Results of the archaeological monitoring of the GI works have demonstrated significant archaeological potential to exist within the stretch between Stephen Bank and Carkin Moor. This area was largely untouched by the previous A66 widening scheme, aside from three test pits excavated within the Scheduled Monument of Carkin Moor Roman Fort (Zant and Howard-Davis 2013, 17–18), only one of which, sited over the defensive ditch, encountered archaeological remains (*ibid.*, Trench 13). However, the discovery of a substantial Roman settlement along the southern verge of the A66, to the west of the fort (NAA 2016 and in prep.), serves to confirm that the surrounding area is likely to be rich in surviving subterranean archaeological remains.
- 7.12 The previous A66 widening scheme also demonstrated that archaeological remains were encountered less frequently to the west of Stephen Bank, the area westwards to Greta Bridge being found to be largely devoid of archaeological remains aside from post-medieval ridge and furrow (GBA12) and a post-medieval quarry (GBA21; Zant and Howard-Davis 2013, 14). An earlier geophysical survey carried out along the same stretch (GeoQuest Associates 1999) did, however, highlight areas of archaeological potential outside the development corridor; therefore, the presence of archaeological remains should not be entirely discounted based on the negative results of the current GI works between Cross Lanes and Rokeby.
- 7.13 A number of trial pits in the vicinity of Greta Bridge were excluded from the works described here (TP CLR016–019, TP CLR021–022). As the location of a Roman fort and associated *vicus*, this area arguably holds significant archaeological potential. Previous excavations within the scheduled area revealed a well-preserved section of the Roman road and demonstrated that the *vicus* extended to the north of the fort, both to the east and west, for a considerable distance, with remains also surviving beneath the existing carriageway of the A66 (Casey 1998). The full extent of the *vicus* and hinterland of the

fort at Greta Bridge is unknown and therefore any further work in the area as part of the carriageway upgrade could provide valuable information regarding the potential western limit of Roman occupation in this area.

- 7.14 Aside from an assemblage of large stones in CLR007 that could potentially relate to an archaeological feature, no further remains were encountered in the trial pits between Bowes and Rokeby. Even so, the historical and archaeological potential of the area cannot be discounted owing to the number of scheduled monuments and known historical sites distributed along the route of the A66. The course of the routeway is one which has funnelled human traffic through the trans-Pennine corridor for millennia and therefore the presence of multi-period archaeology should be anticipated during the execution of future works.

8.0 ARCHIVE DEPOSITION

- 8.1 The full digital archive from the archaeological investigations is to be deposited online in the Archaeology Data Service website.

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APPENDIX A
CONTEXT CATALOGUE

Context Number	Description	Trial Pit
1	Fill of pit 02	TP SBC018
2	Cut of pit	TP SBC018
3	Fill of pit 04	TP SBC018
4	Cut of pit	TP SBC018
5	Wall foundation	TP SBC012
6	Cut of ditch/trackway	TP SBC042
7	Alluvial clay deposit	TP SBC035
8	Stone 'trackway' surface in 06	TP SBC042
9	Brownish-grey fill of 06	TP SBC042
10	Metalled surface on 09	TP SBC042
11	Sandstone farm track	TP SBC041
12	Stone, clay and cinder bedding material of railway	TP BB006
13	Mixed plough-soil of furrow	TP BB008/BB009
14	Assemblage of large stones	TP CLR007

APPENDIX B
TRIAL PIT DEPOSIT MODELS

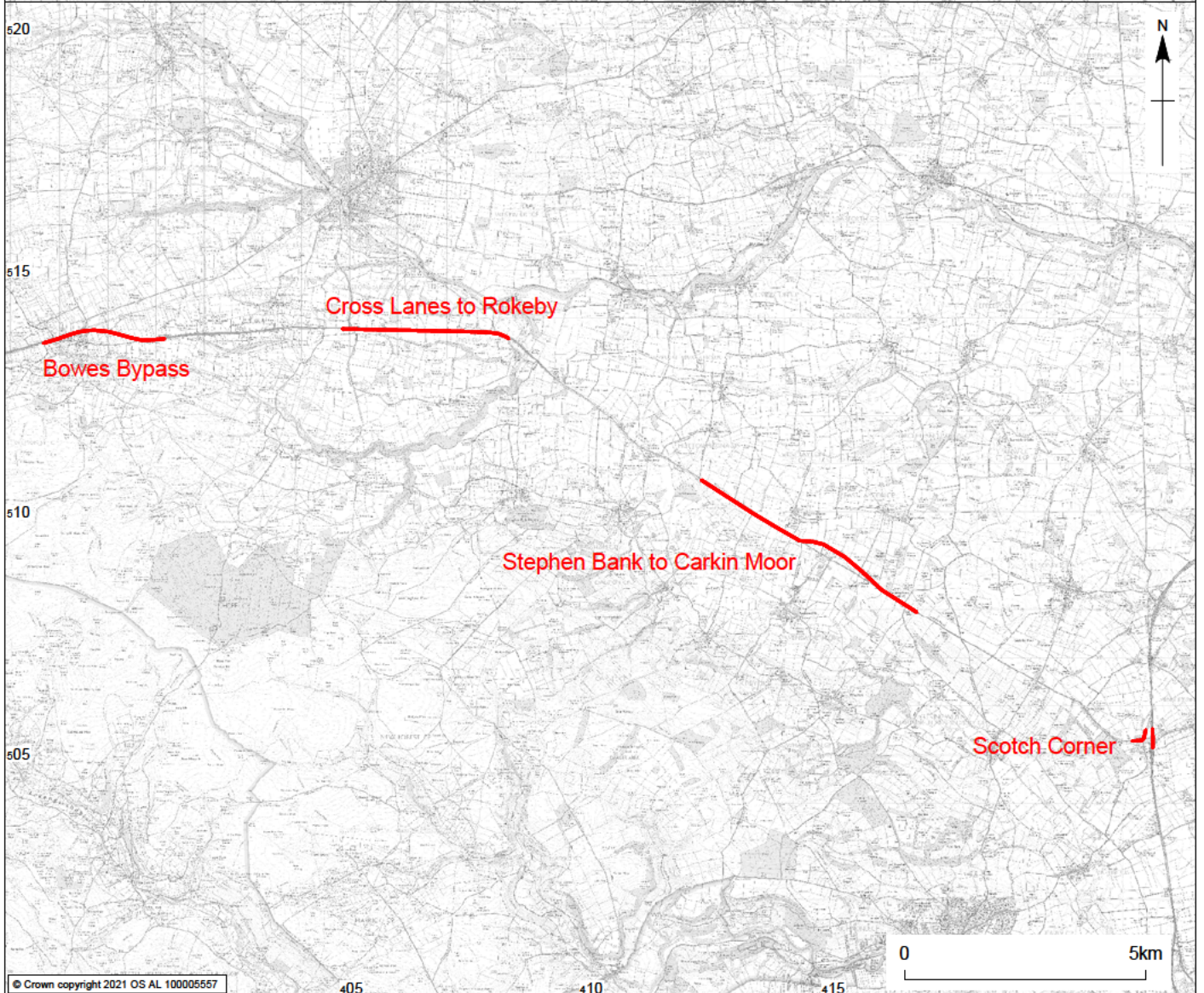
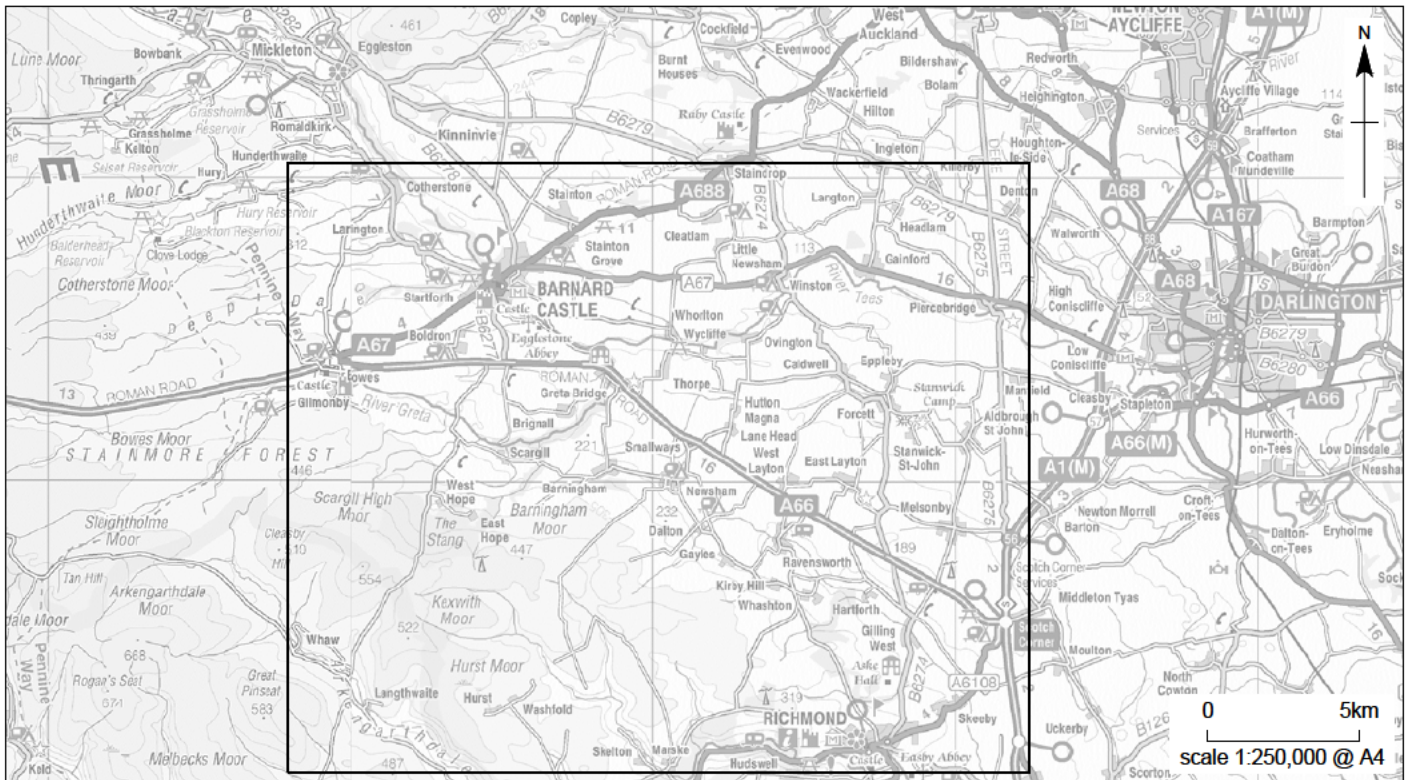
The values given in the table below relate to the depths of the deposits within each GI intervention. Where bedrock was reached, the depth at which it was encountered is given.

Trial Pit	Deposit Sequence
Bowes Bypass	
TP BB001	0.3m Topsoil 0.3–0.6m Subsoil 0.6–3.1m Natural Yellow Clay
TP BB002	0.2m Topsoil 0.2–0.5m Subsoil 0.5–4.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP BB003	0.2m Topsoil 0.2–0.5m Subsoil 0.5m–4.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP BB004	0.2m Topsoil 0.2–0.5m Subsoil 0.5–4.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP BB005	0.2m Topsoil 0.2–1m Modern Backfill of Service Trench 1–4.5m Natural Yellowish-Brown Sandy Clay 4.5m+ Limestone Bedrock
TP BB006	0.2m Topsoil 0.2–0.4m Mixed stone, clay and cinders 12 0.4–4.5m Mid Brown to Dark Grey Boulder Clay
TP BB007	0.15m Topsoil 0.15–0.35m Subsoil 0.35–2.5m Natural Yellow Clay to Dark Grey Boulder Clay 2.5–4.5m Mudstone
TP BB008	0.15m Topsoil 0.15–0.6m Mixed plough-soil of ridge 13 0.6–1.7m Natural Mid Orange-Grey Gravelly Clay 1.7m+ Sandstone Bedrock
TP BB009	0.15m Topsoil 0.15–0.6m Mixed plough-soil of ridge 13 0.6–1.9m Natural Mid Orange-Grey Gravelly Clay 1.9m+ Sandstone Bedrock
TP BB010	0.2m Topsoil 0.2–1.5m Natural Yellow Clay 1.5–3.1m Natural Dark Grey Sandy Silt and Gravel – Riverine?
TP BB011	0.3m Topsoil 0.3–0.5m Subsoil 0.5–2.5 Natural Yellow Clay to Dark Grey Boulder Clay 2.5+ Mudstone
TP BB012	0.2m Topsoil 0.2–0.3m Subsoil 0.3–4m Natural Yellow Clay to Dark Grey Boulder Clay
TP BB013	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3m Natural Yellow Clay to Dark Grey Boulder Clay
TP BB014	0.15m Topsoil 0.15–0.3m Subsoil 0.3–3m Natural Yellow Clay to Dark Grey Boulder Clay
Cross Lanes to Rokeby	
TP CLR001	0.25m Topsoil 0.25–0.65m Subsoil 0.65–2m Natural Yellow Clay and Gravel 2.0–3.7m Natural Dark Grey Boulder Clay
TP CLR002	0.3m Topsoil (N-S plough-scars visible in clay beneath)

Trial Pit	Deposit Sequence
	0.3–2m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR002a	0.3m Topsoil (E-W plough-scars visible in clay beneath) 0.3–2.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR003	0.3m Topsoil 0.3–2m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR004	0.25m Topsoil 0.25–4.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR005	0.2m Topsoil 0.2–4.5m Natural Orange-brown Gravelly Clay to Dark Grey Boulder Clay
TP CLR006	0.2m Topsoil 0.2–4.5m Natural Orange-brown Gravelly Clay to Dark Grey Boulder Clay
TP CLR007	0.25m Topsoil 0.25–0.55m Subsoil overlying stones 14 0.55–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP CLR008	0.2m Topsoil 0.2–0.4m Subsoil 0.4–3m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR009	0.2m Topsoil 0.2–0.4m Subsoil 0.4–3m Natural Yellow Clay to Dark Grey Boulder Clay
TP CLR010	0.25m Topsoil 0.25–0.7m Natural Yellow Clay 0.7–4m Dark Grey Boulder Clay
TP CLR011	0.3m Topsoil 0.3–0.8m Natural Yellow Clay 0.8–4.5m Dark Grey Boulder Clay
TP CLR012	0.25m Topsoil 0.25–0.55m Subsoil 0.55–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP CLR013	0.25m Topsoil 0.25–0.35m Subsoil 0.35–3m Natural Brownish-Yellow Stony Clay to Dark Grey Boulder Clay
TP CLR015	0.3m Topsoil 0.3–0.4m Subsoil 0.4–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP CLR020	0.15m Topsoil 0.15–0.45m Subsoil 0.45–4.5m Natural Orange-brown Gravelly Clay to Dark Grey Boulder Clay
TP CLR023	0.2m Topsoil 0.2–0.45m Subsoil 0.45–4.5m Natural Orange-brown Gravelly Clay to Dark Grey Boulder Clay
Stephen Bank to Carkin Moor	
TP SBC001	0.25m Topsoil 0.25–0.70m Natural Yellow Sandy Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC002	0.15m Topsoil 0.15–2.5m Natural Orange-brown Stony, Gravelly Clay to Dark Grey Boulder Clay
TP SBC003	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP SBC004	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC005	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3m Natural Brownish-Yellow Clay to Dark Grey Boulder Clay
TP SBC006	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3m Natural Brownish-Yellow Clay to Dark Grey Boulder Clay
TP SBC007	0.15m Topsoil 0.15–0.5m Subsoil 0.5–3.5m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP SBC008	0.15m Topsoil 0.15–2m Natural Yellow Stony Clay to Dark Grey Boulder Clay

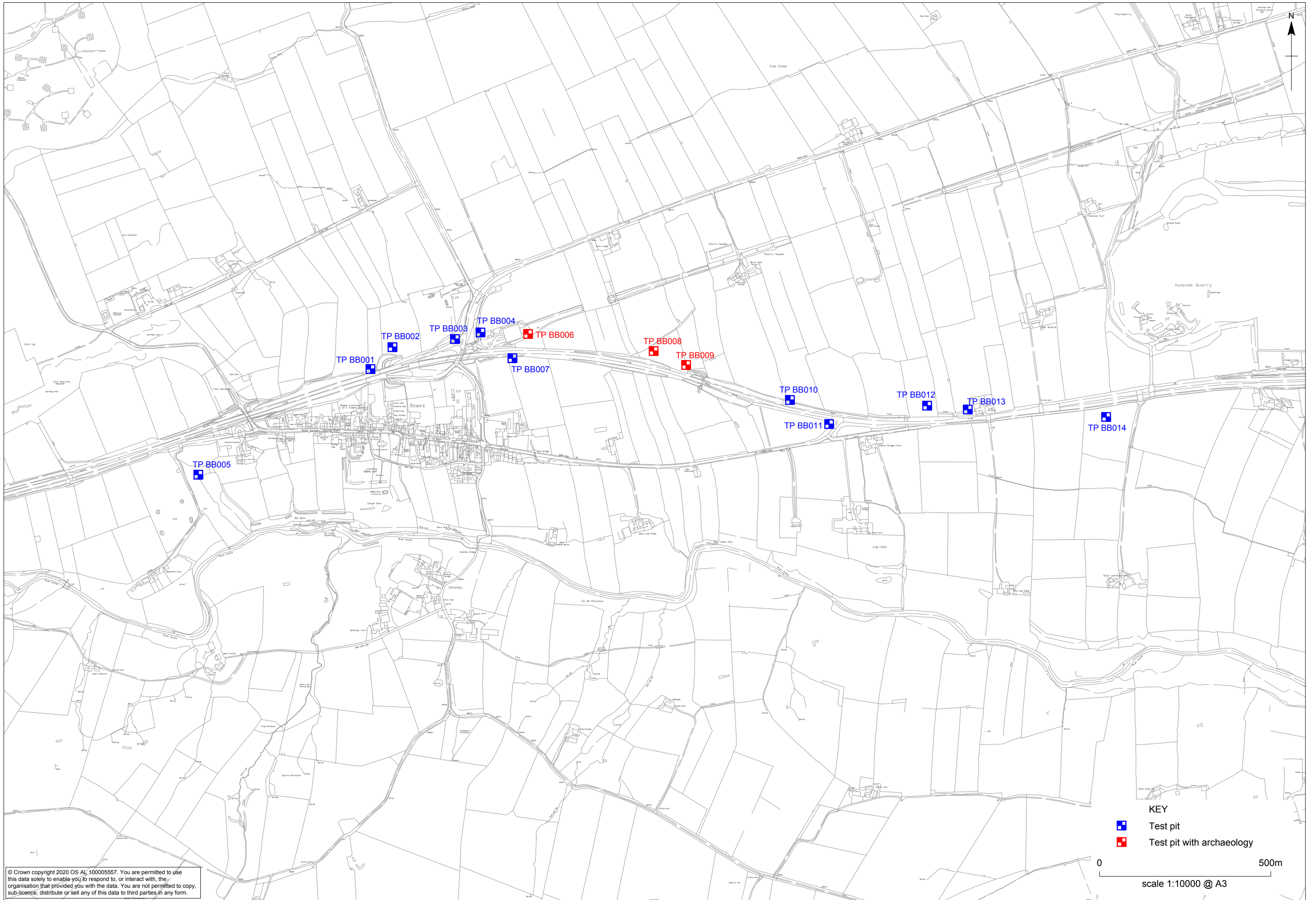
Trial Pit	Deposit Sequence
	2–5.5m Mudstone
TP SBC009	0.1m Topsoil 0.1–0.2m Subsoil 0.2–1.2m Natural Light-Yellow Clay 1.2–3.5m Dark Grey Boulder Clay
TP SBC010	0.2m Topsoil 0.2–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP SBC011	0.2m Topsoil 0.2–3m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP SBC012	0.4m Topsoil 0.4–0.8m Natural Yellow Stony Clay 0.8–3m Dark Grey Boulder Clay
TP SBC013	0.25m Topsoil 0.25–0.35m Subsoil 0.35–0.8m Natural Yellow Stony Clay 0.8–3m Dark Grey Boulder Clay
TP SBC014	0.3m Topsoil 0.3–0.7m Gravelly Subsoil 0.7–1.5m Natural Brownish-Yellow Stony Clay 1.5m Water table encountered
TP SBC015	0.25m Topsoil 0.25–0.35m Subsoil 0.35–0.8m Natural Brownish-Yellow Clay 0.8–3m Dark Grey Boulder Clay
TP SBC016	0.3m Topsoil 0.3–0.70m Natural Yellow Sandy Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC017	0.4m Topsoil 0.3–0.7m Natural Yellow Sandy Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC018	0.5m Topsoil 01, 03 – Fills of pits 02 and 04 02, 04 – Cuts of pits 0.5–0.8m Natural Yellow Clay 0.8–3.5m Dark Grey Boulder Clay
TP SBC019	0.4m Topsoil 0.4–1m Natural Yellow Clay 1–3m Dark Grey Boulder Clay
TP SBC020	0.3m Topsoil 0.3–3m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC021	0.3m Topsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay Sandstone Bedrock outcrop at c.1m at northern edge.
TP SBC022	0.30m Topsoil 0.3–0.70m Natural Yellow Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC023	0.3m Topsoil 0.3–0.70m Natural Yellow Sandy Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC024	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3.5m Natural Yellow Stony Clay to Dark Grey Boulder Clay
TP SBC025	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC026	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC027	0.2m Topsoil 0.2–0.3m Subsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC028	0.3m Topsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC029	0.2m Topsoil

Trial Pit	Deposit Sequence
	0.2–0.6m Natural Yellow Clay 0.6–3.5m Dark Grey Boulder Clay
TP SBC030	0.3m Topsoil 0.3–0.6m Natural Yellow Clay 0.6–1.6m Yellowish-Brown Sandy Clay 1.6–3.5m Dark Grey Boulder Clay
TP SBC031	0.2m Topsoil 0.2–3.2m Natural Yellow Clay to Dark Grey Boulder Clay
TP SBC032	0.3m Topsoil 0.3–0.8m Natural Yellow Clay 0.8–3.5m Dark Grey Boulder Clay
TP SBC033	0.4m Topsoil 0.4–1m Natural Yellow Clay 1–3m Dark Grey Boulder Clay
TP SBC034	0.25m Topsoil 0.25–0.70m Natural Yellow Sandy Clay 0.7–3.5m Dark Grey Boulder Clay.
TP SBC035	0.3m Topsoil 0.3–0.5m Subsoil 0.5–0.7m Natural Yellow Clay with lens of Bluish Grey Clay 0.7–1.2m Natural Yellow Sandy Clay 1.2–3.5m Dark Grey Boulder Clay
TP SBC036	0.3m Topsoil 0.3–0.70m Natural Yellow Stony Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC038	0.4m Topsoil 0.4–0.60m Subsoil 0.6–1.2m Natural Yellow Stony Clay 1.2 – 3.5m Dark Grey Boulder Clay
TP SBC039	0.3m Topsoil 0.3–0.70m Natural Yellow Stony Clay 0.7–3.5m Dark Grey Boulder Clay
TP SBC040	0.0.25m Topsoil 0.25–0.55m Subsoil 0.55–1.2m Natural Orange-Grey Sandy Clay 1.2-3.5m Dark Grey Boulder Clay
TP SBC041	0.2m Topsoil 0.2–3m Natural Yellowish-Brown Sandy Clay to Dark Grey Boulder Clay
TP SBC042	0.3m Topsoil 0.3–3.5m Natural Yellow Clay to Dark Grey Boulder Clay 3.5m+ Laminated Sandstone Bedrock
TP SBC043	0.3m Topsoil 0.3–1.2m Natural Brownish-Yellow Sandy Clay 1.2-3.5m Dark Grey Boulder Clay
TP SBC044	0.0.25m Topsoil 0.25–0.55m Subsoil 0.55–1.2m Natural Brownish-Yellow Sandy Clay 1.2-3.5m Dark Grey Boulder Clay



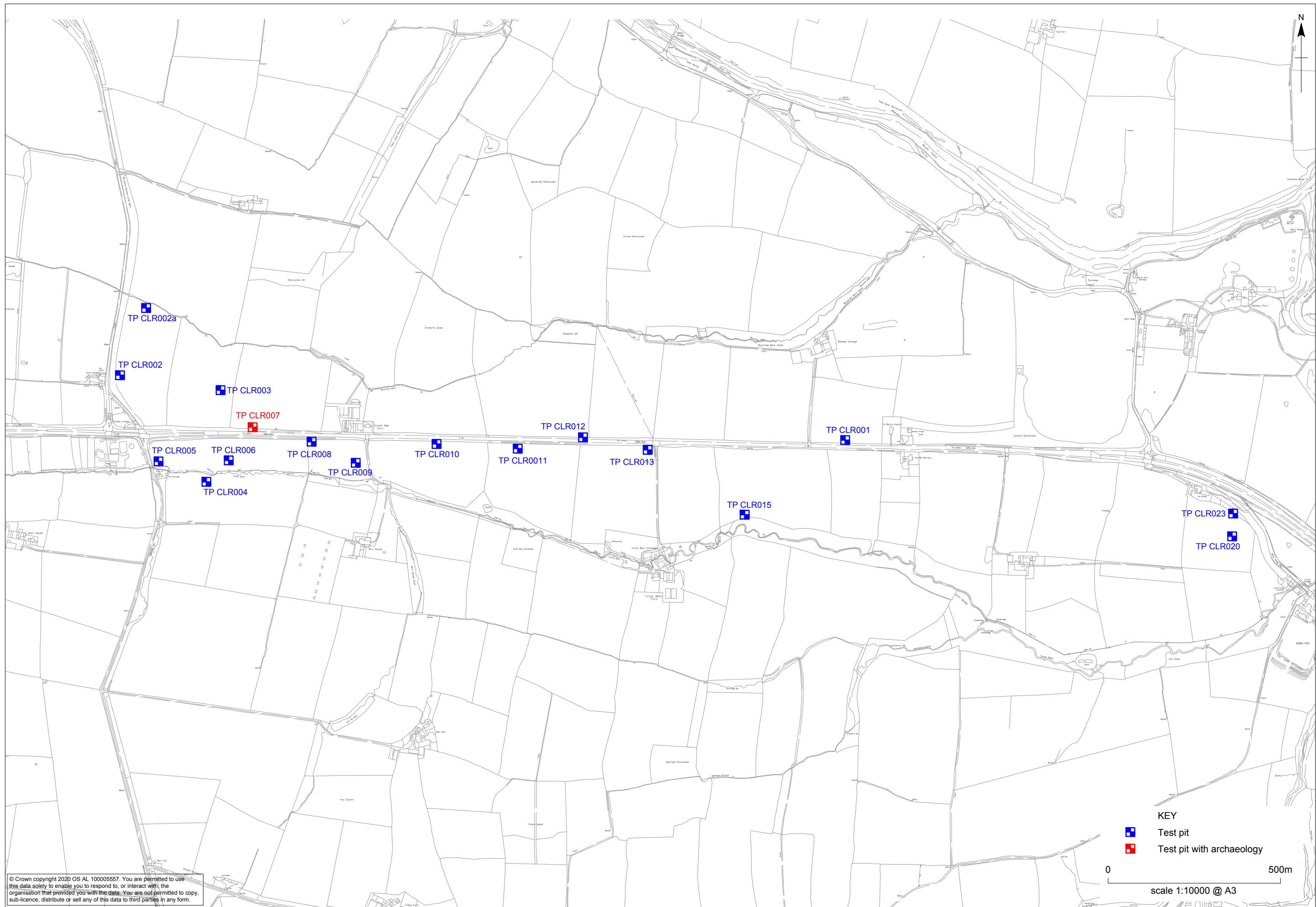
A66 Bowes to Scotch Corner: general location of ground investigations

Figure 1



A66 Bows to Scotch Corner: location of test pits, Bows Bypass

Figure 2

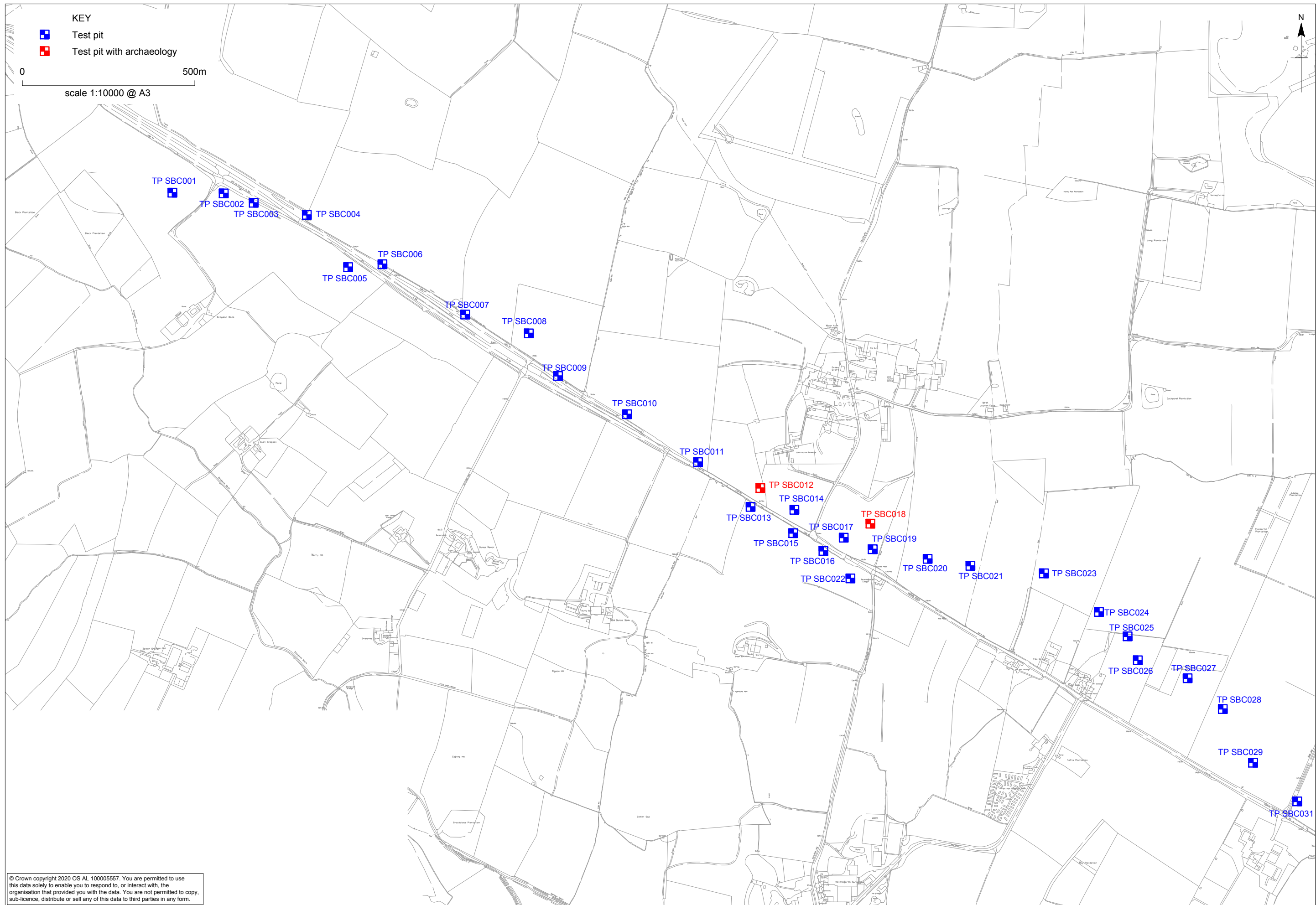


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A66 Bowes to Scotch Corner: location of test pits, Cross Lanes to Rokeby

Figure 3

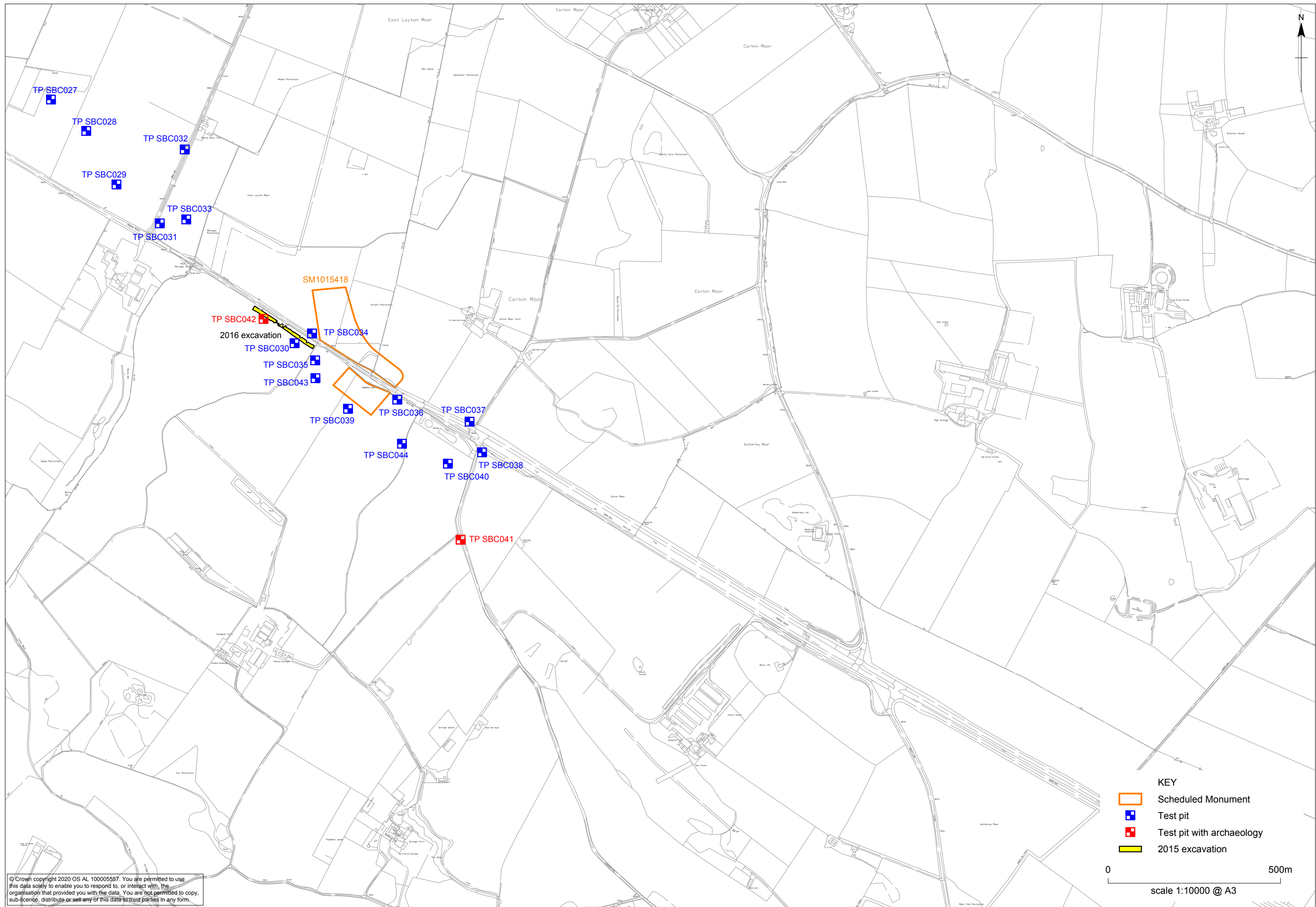


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A66 Bowes to Scotch Corner: location of test pits, Stephen Bank to Carkin Moor (north-west)

Figure 4



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A66 Bowes to Scotch Corner: location of test pits, Stephen Bank to Carkin Moor (south-east)

Figure 5

A66 NORTH TRANS PENNINE SCHEME C SECTION 11



Final Factual Report
(Rev.00)

**Allied
Exploration &
Geotechnics Ltd.**

Contract Number: 4322B
Client: AMEY OW Limited
Consulting Engineer: Arup

Date: September 2021

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REPORT CONTROL SHEET

Contract Details

Contract Title	A66 North Trans Pennine Scheme C Section 11
Contract Number	4322B
Location	Scotch Corner Roundabout
National Grid Reference	NZ 217 053

Report Details

Report Status	Final (Rev.00)		
Report Type	Factual		
Volume Number	1	of	1
Copy Number	PDF	of	PDF
Report Recipient	Robert Nuthall	Arup	

Client/Consultant Engineer Details

Client	Consultant Engineer
AMEY OW Limited Chancery Exchange 10 Furnival Street London EC4A 1AB	Arup Central Square Forth Street Newcastle upon Tyne NE1 3PL

Signed & Approved
On Behalf of Allied Exploration & Geotechnics Limited

Reports Engineer		Date:
Laura Clark BSc (Hons)		08/09/2021
Technical Manager		Date:
Kerry Wad BSc (Hons), MSc, FGS, MCM		08/09/2021
Managing Director		Date:
Nick Vate BSc (Hons), MSc, CGeol, EurGeol, FGS		08/09/2021

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A66 NORTH TRANS PENNINE SCHEME C SECTION 11

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FIELD DATA ENCLOSURES:

Key Sheets	0
Exploratory Hole Location Plan	1
Window/Windowless Sample Hole Records	2
Inspection Pit Records	3
Groundwater Observation Made at the Time of Site Works	4

IN-SITU TESTING ENCLOSURES:

Test Report Certificate	0
Standard Penetration Test Results	1
Hand Shear Vane Test Results	2

LABORATORY ENCLOSURES:

Laboratory Report Certificate	0
Sample Description Sheets	1
Moisture Content/Plasticity Index and Moisture Content	2
Determination of Particle Density	3
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Abbreviation	Definition
WLS	Windowless Sampling

Text Abbreviations

1. INTRODUCTION

The investigation works were commissioned in order to determine the ground and groundwater conditions on site at the A1(M) Scotch Corner Roundabout prior to the proposed works.

Allied Exploration & Geotechnics Limited (AEG) were contracted by AMEY OW Limited with Arup acting in the capacity of Consulting Engineer to perform a ground investigation at this site in order to provide information on the subsurface ground and groundwater conditions as well as to obtain samples for geotechnical and specialist chemical testing.

1.1 Scope of Works

The investigation works consisted of the following main elements:

- Two windowless sample holes, advanced using a removable liner system.
- Four hand excavated inspection pits.
- Associated sample holes.
- *In-situ* standard penetration and hand shear vane testing.

Site work was carried out between the 11th and 16th March 2021 with subsequent laboratory testing and reporting thereafter. A factual report only was requested.

The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and on the results of tests carried out in the field and in the laboratory. There may, however, be special conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report.

2. THE SITE

2.1 Location

The National Grid Reference of the approximate centre of the site is NZ 217 053. This can be found on Ordnance Survey 1:50,000 Sheet Number 93 (Middlesbrough, Darlington & Hartlepool). Part of this sheet is reproduced as Figure 1, the Site Location Plan.

The site is located on the A1(M) Scotch Corner roundabout, approximately 11km southwest of Darlington town centre.

2.2 Site Description and Topography

The site is located off the A1(M) Scotch Corner Roundabout and comprises grassed verges and the carriageway of the roundabout and associated slip roads. The site is bound by the A1(M) to the west, the motorway service building to the north and grassed fields to the east.

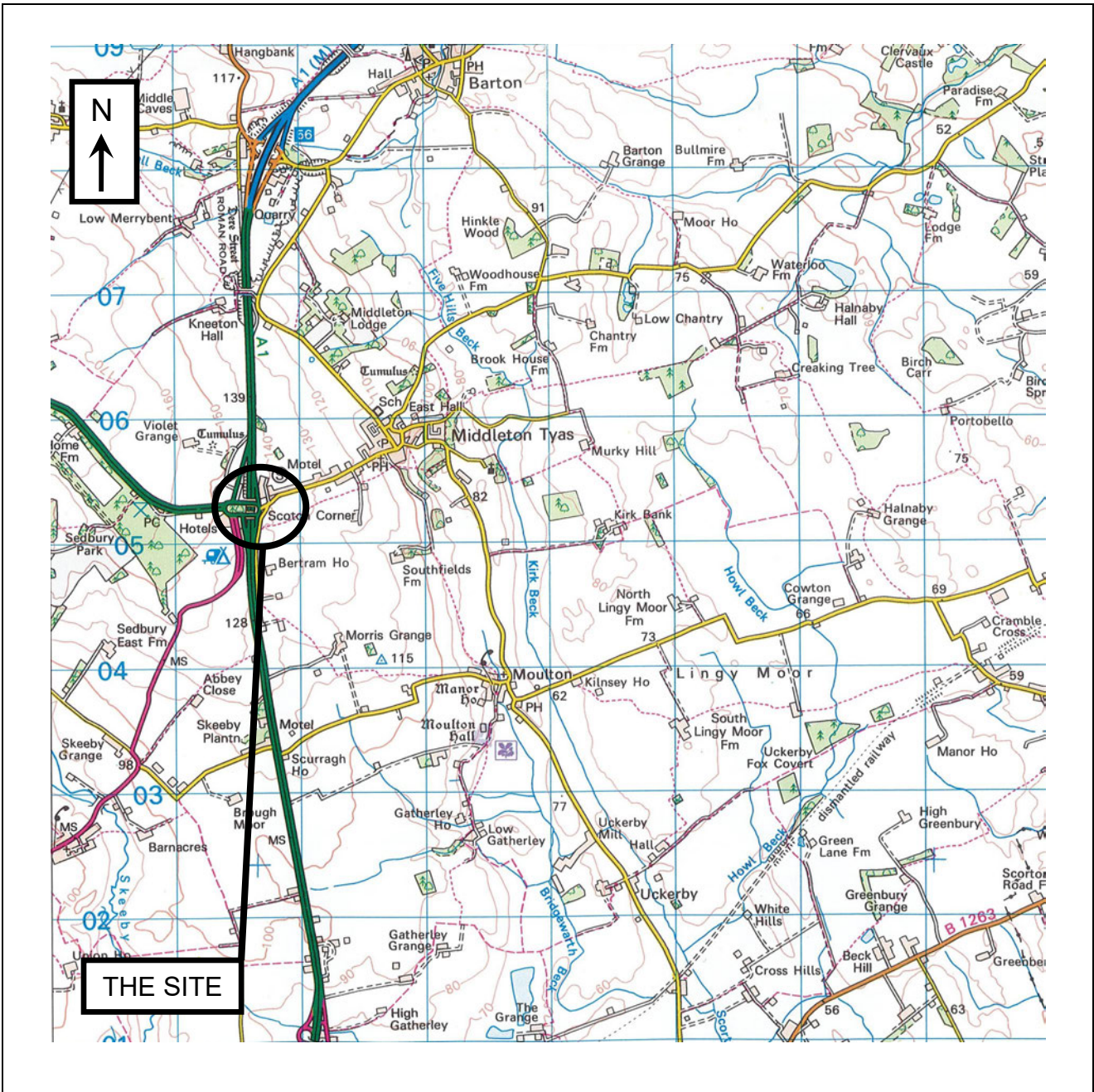


Figure 1: Site Location Plan

Reproduced from the Ordnance Survey 1:50,000 scale Landranger map by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, Crown Copyright. All rights reserved. Licence number AL 10002282.

3. SITE OPERATIONS

3.1 General

All exploratory hole work, associated sampling, *in-situ* testing and logging was carried out in accordance with techniques outlined in Table 1, as appropriate; at positions as near as practicable to those supplied by the Consulting Engineer. These are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

Reference Code Number	Title
BS 1377:1990	Methods of Test for Soils for Civil Engineering Purposes (where not in contravention or superseded by Eurocode references)
BS 5930:2015	Code of Practice for Ground Investigation (where not in contravention or superseded by Eurocode references)
BS EN ISO 14688-1:2002 & 14688-2:2004	Identification and Classification of Soil
BS 10175:2011+A2:2017	Investigation of Potentially Contaminated Sites
BS EN ISO 22476-3: 2005	Geotechnical investigation and testing - Field testing - Part 3 Standard Penetration Testing

Table 1: British Standard Reference Code Number

The depths of all windowless sample holes and inspection pits, descriptions of the material encountered, details of any groundwater encountered, samples taken and *in-situ* testing carried out together with any other relevant information can be found on the Windowless Sample Hole and Inspection Pit Records, Field Data Enclosures 2 and 3 respectively. A key to all symbols and abbreviations used throughout the report is included in the Key Sheets.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay).. Refer to the Key Sheets for further information.

3.2 Health & Safety Considerations: Services

Before the commencement of any exploratory hole a search for underground services was conducted as prescribed in HSE publication '*Avoiding Underground Services (HSG47)*' and in accordance with in-house internal safety procedure AEG-14.

Service plans were provided by the Client and were consulted prior to using a service locating device (such as a Cable Avoidance Tool or C.A.T.) to scan a working area around the proposed exploratory hole location. Where no services were indicated a '*Permit-to-Work*' form was issued by the investigation supervisor and, the position was commenced with a hand excavated inspection pit. The inspection pit was also scanned during the excavation procedure. It should be noted that the digging of an inspection pit only confirms or guards against the possible presence of underground public utility services within the excavated pit. Where no services were indicated by the scanning procedure or inspection pit the exploratory hole was commenced in accordance with the Contract Specification.

Where services were located or there was reasonable belief that they were present, the position was relocated in agreement with the Client. Details of any services uncovered/located during this investigation are given in Table 2.

Exploratory Hole Number	Type of Service	Orientation & Depth (size where indicated)	Status (Damaged/Undamaged)	Additional Remarks
HDP A1SC001	Ribbed and perforated plastic drainage pipe	341° at 0.60m BGL (200mm diameter)	Undamaged	Hole terminated

Table 2: Services Encountered

3.3 Exploratory Holes: Window/Windowless Sample Holes

Two windowless sample holes were sunk using a Premier Compact 110 Series tracked rig utilising a removable liner system, to depths of 2.80m (WS A1SC005) and 6.65m BGL (WS A1SC006). The Window/Windowless Sample Hole Records are presented as Field Data Enclosure 2 and a summary of any relevant remarks are detailed in Table 3.

Exploratory Hole Number	Drilling Method	Completion Depth (m BGL)	Installation	Remarks
WS A1SC005	WLS	2.80	No – reinstated	Terminated due to an obstruction.
WS A1SC006	WLS	6.65	No – reinstated	Advanced to required depth.

Any relevant photographs are presented after the applicable Window/Windowless Sample Hole Record

Table 3: Window/Windowless Sample Hole Summary

3.4 Exploratory Holes: Hand Excavated Inspection Pits

Four inspection pits were hand excavated to depths of 0.60m (HDP A1SC001) and 1.20m BGL (HDP A1SC001A, HDP A1SC002 & HDP A1SC003). The Inspection Pit Records are presented as Field Data Enclosure 3 and a summary of any relevant remarks are detailed in Table 4.

Exploratory Hole Number	Excavation Method	Completion Depth (m BGL)	Remarks
HDP A1SC001	Hand Excavated	0.60	Terminated due to encountering a service.
HDP A1SC001A	Hand Excavated	1.20	Advanced to required depth.
HDP A1SC002	Hand Excavated	1.20	Advanced to required depth.
HDP A1SC003	Hand Excavated	1.20	Advanced to required depth.

Any relevant photographs are presented after the applicable Inspection Pit Record

Table 4: Inspection Pit Summary

3.5 Samples

Representative samples of soil were obtained from the windowless sample holes and inspection pits and were taken to the laboratory for selected geotechnical and specialist chemical testing.

Environmental samples were taken in accordance with the contract specification during the investigation using an approved selection of container types in order to suit the encountered material properties and

designated laboratory analytical parameters. Full chain of custody procedures were in place post sampling and during the transportation stage to the nominated specialist chemical laboratory. Environmental samples were administered appropriately following the best practice guidance provided in the contract specification.

3.6 Groundwater

The comments on groundwater conditions are based on the observations made at the time of investigation. It should be noted that groundwater levels may vary due to seasonal and other effects.

Distinct groundwater strikes were not encountered in the windowless sample holes and inspection pits during the site works operation.

3.7 Instrumentation & Monitoring

Groundwater or gas monitoring instrumentation was not installed into any completed exploratory hole as part of this investigation contract.

3.8 Operative Observations: Potential Contamination

For the purposes of determining the condition of the site, with regard to human health and environmental issues, reference should specifically be made to any specialist chemical testing undertaken as part of the investigation scheme, as well as any supporting desk study and risk assessment documentation. The information given herein collates the observations made by the operatives involved in the investigation only and comments that have been indicated on the engineering records.

Where there was potential evidence of contamination, principally as a consequence of olfactory and visual identification, information is provided in Table 5.

Exploratory Hole Number	Occurrence (<i>in-situ</i> /surface/ laboratory sample)	Visual / Olfactory / Laboratory Testing	Depth (m BGL)	Occurrence Type	Additional Remarks
WS A1SC005	<i>In-situ</i>	Olfactory	0.00-2.80	Mild hydrocarbon odour noted	None
WS A1SC006	<i>In-situ</i>	Olfactory	0.00-5.65	Mild hydrocarbon odour noted	None

Table 5: Potential Contamination Encountered

It should be stressed that the information provided herein is subjective, as it is based on the perceptions of individuals and not specialists routinely involved in the chemical determination of contaminated residues, liquors, vapours or solid contaminants.

3.9 Surveying

The investigation positions were surveyed after completion of site works using a Leica Smartrover (Model ATX 1230+ GNSS) GPS based instrument which provides corrected Ordnance Survey co-ordinates in real time to an accuracy of within ± 30mm vertical and ± 30mm horizontal. These positions have been

subsequently plotted in AutoCAD® software and are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

4. **IN-SITU TESTING**

4.1 **General**

In-situ testing as specified by the Consulting Engineer was carried out in selected windowless sample holes and inspection pits in accordance with techniques outlined in the relevant British Standard and/or AEG Quality Procedure. The results are presented in the *In-situ* Testing Enclosures with a number of the test results summarised at the relevant depth on the Window/Windowless Sample Hole and Inspection Pit Records.

4.2 **Standard Penetration Test Results**

Standard Penetration Testing (SPT) was carried out in the windowless sample holes in accordance with techniques outlined in BS EN ISO 22476-3: 2005 in order to determine the relative density and consistency of the strata encountered. The 'N' value (number of blows per 300mm penetration) or the penetration per blow was recorded for each test. Uncorrected 'N' values or penetration per blow data are provided on the applicable Window/Windowless Sample Hole Records. (Refer to page 6 of the key sheets for further details).

More detailed information concerning the standard penetration testing is given in *In-situ* Testing Enclosure 1 which includes the following;

- Initial exploratory hole conditions prior to the test procedure.
- Calibration and energy ratio (E_m) information for the SPT hammer device used to carry out the test.
- A breakdown of blows for each 75mm penetration interval.
- Rod length (C_R) and energy (C_E) correction ratios.
- Uncorrected 'N' value.
- Corrected 'N₆₀' value that applies the rod (C_R) and energy (C_E) corrections indicated.
- Pertinent remarks corresponding to the test procedure.

In addition to the above, a graph has been prepared for each exploratory hole which plots the uncorrected and corrected 'N' value results against depth. Calibration certificates for the SPT apparatus used during the testing procedure are also presented for reference within this *In-situ* Testing Enclosure.

4.3 **Hand Shear Vane**

Hand shear vane testing using calibrated Edeco Pilcon Hand Vane equipment was carried out in the inspection pits in accordance to the ground conditions encountered. The results are presented in detail within *In-situ* Testing Enclosure 2 with the average peak and residual shear strength values provided on the applicable Inspection Pit Record.

5. LABORATORY TESTING

5.1 General

Laboratory testing as scheduled by the Consulting Engineer was carried out on selected samples in accordance with techniques outlined in BS 1377:1990, AEG Laboratory Quality Procedures or other appropriate standard as quoted.

5.2 Geotechnical Testing

The results are presented in the Laboratory Enclosures with an outline list of the procedures undertaken given in Table 6.

Test	Procedure
Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Plasticity Index and Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Determination of Particle Density	BS 1377 Part 2 1990
Particle Size Distribution Sieving	BS 1377 Part 2 1990
Particle Size Distribution Sedimentation	BS 1377 Part 2 1990
Determination of California Bearing Ratio	BS 1377 Part 4 1990

Table 6: Geotechnical Testing

5.3 Specialist Chemical Testing

Selected samples have been submitted for chemical analysis as specified by the Consulting Engineer, conducted under a subcontract arrangement with Derwentside Environmental Testing Services (DETS). The results of this testing are presented as Appendix I.

5.4 Laboratory Identified Asbestos

Selected samples were analysed for asbestos content as specified by the Consulting Engineer. Any identified asbestos is presented in Table 7 which has been summarised from specialist chemical testing results (see Appendix I for further details).

Exploratory Hole Number	Occurrence	Depth (m BGL)	Occurrence Type	Additional Remarks
No asbestos was detected within the samples selected for testing by the Consulting Engineer				

Table 7: Laboratory Identified Asbestos

Key Sheets





Allied Exploration and Geotechnics Limited

Key Sheets



INTRODUCTION

The following explanatory notes define the terminologies, abbreviations and symbols pertaining to each individual column or section of the Exploratory Hole records. 'Exploratory Hole' is used as a general term in this report to comprise borehole, drillhole, and trial pit. All exploratory hole records have been produced using 'gINT®', which is an integrated software environment for the storage and manipulation of subsurface data.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay). With respect to rotary coring, driller's records and observations of the recovered core are used to determine any zones of no recovery (core loss). These zones are based on the interpretation of the logging engineer and are therefore potentially subjective. In addition, where relevant, every effort is made to highlight material/zones that may relate to suspected old workings. However, it should be noted that this is not straightforward (especially without detailed information regarding anticipated subsurface conditions) and therefore no guarantee can be made with regards to the accuracy of the interpretation of the recovered core.

INFORMATION COMMON TO ALL EXPLORATORY HOLE RECORDS

Status Box

The status box in the top right hand corner of each exploratory hole record gives the status of each individual record i.e. PRELIM1, PRELIM2, PRELIM3 FINAL etc. The date shown relates to the last instance the data was revised. This information is for AEG Quality Assurance only.

Exploratory Hole No

The identity number used throughout the report.

Project

The ground investigation project name. Occasionally the project name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Client

Client's name responsible for funding the ground investigation project. The Client's name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Location

The exploratory hole position given as either national grid co-ordinates, local grid if specified, or a reference name normally pertaining to the area of investigation.

Method (Equipment)

Represents the drilling, excavation or boring method(s) or equipment used.

Ground Level (m(AOD))

The precise ground level in metres above Ordnance Datum at the exploratory hole location from which the reduced level for each stratigraphic boundary is calculated.

Date

The date relating to the start of the exploratory hole excavation.

Sheet

The sheet number and total number of sheets for the particular record.

Checked By

Printed signature of the person who has carried out the technical quality check on the log.

Logged By

The name of the engineer who has carried out the logging of the exploratory hole.

Contract No.

The Allied Exploration & Geotechnics Limited reference number for the project.



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Key Sheets






INFORMATION RELEVANT TO BOREHOLE AND WINDOW/WINDOWLESS SAMPLE HOLE RECORDS

Sample & Tests Columns

Depth	The depth over which a sample or test is taken is shown in depth column of the exploratory hole record in a "from...to" format.
Type No	Indicates the type of sample/test and number given by the driller.
Test Result	Result of the test given in the applicable units.

Water Column

Water Strike	Level of groundwater strike within an exploratory hole. The symbol  denotes a water strike and is suffixed with a number, which indicates the strike order. The corresponding unfilled symbol  is the depth the strike rose to.
Seepage	Groundwater seepage within an exploratory hole is denoted by the  symbol.

Strata Columns

Reduced Level	The corresponding reduced level of each soil or rock boundary in metres Ordnance Datum.
Legend	A graphical representation of the materials encountered using BS 5930 recommended symbols for soil and rock.
Depth (Thickness)	The depth below ground level of each soil or rock boundary in metres and the thickness of each individual stratigraphic unit (given in brackets).
Description	<p>Engineering description of each individual soil or rock type follows recommendations outlined in the current BS 5930 with the following implementation:</p> <ol style="list-style-type: none"> The amendment of section 6 incorporates the guidance indicated in BS EN ISO 14688-1, BS EN ISO 14688-2 and BS EN ISO 14689-1 European Standard with particular emphasis on current UK practice. Supplementary laboratory or in-situ assessed measurements of undrained strength are provided where applicable information is available in parenthesis in accordance with BS 5930 after the field strength determined consistency. The description based measurement table indicating the quantitative undrained strength classification divisions is provided in Key Sheets Table 1.

Term based on measurement	Undrained strength classification definition cu, in kPa (from BS EN ISO 14688-2, 5.3, Table 6)
Extremely low	<10
Very low	10-20
Low	20-40
Medium	40-75
High	75-150
Very High	150-300
Extremely High	300-600

KEY SHEETS TABLE 1

- Cobble and boulder content is expressed in accordance with the terms provided in BS5930 where visually identified in trial pit excavations, or inferred/recovered during the drilling operations. The assessment of frequency and spatial occurrence of coarse and very coarse rock material should not be considered as precise, but only an indicator or estimate of the potential conditions. It should be noted that the recovery of coarse or very coarse particles in boreholes is dependent on the limitations imposed by the casing diameter. The terminology used is outlined in Key Sheets Table 2.



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Key Sheets



Fraction	Percent by Mass	Term
Boulders	<5	Low boulder content
	5 to 20	Medium boulder content
	>20	High boulder content
Cobbles	<10	Low cobble content
	10 to 20	Medium cobble content
	>20	High cobble content

KEY SHEETS TABLE 2

- 4 Rock Strength based on assessed field or measured unconfined compressive strength follows the classification scheme given in BS5930 as outlined in Key Sheets Table 3.

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurement (MPa)	Superseded Classification of Rock Strength: Terminology (Strength Range MPa)	Definition for field use
Extremely weak	Scratched by thumbnail, gravel size lumps can be crushed between finger and thumb.	0.6-1.0	<i>Extremely weak (0.6-1.0)</i>	<i>Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.</i>
Very weak	Scratched by thumbnail, lumps can be broken by heavy hand pressure, can be peeled easily by a pocket knife, crumbles under firm blows with point of geological hammer.	1-5	<i>Very weak (1-5)</i>	<i>Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.</i>
Weak	Thin slabs, corners or edges can be broken off with hand pressure, can be peeled by a pocket knife, shallow indentations made by firm blow with point of geological hammer.	5-12.5	<i>Weak (5-25)</i>	<i>Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.</i>
Moderately Weak	Thin slabs, corners or edges can be broken off with hand pressure, can be scratched with difficulty by pocket knife, hand-held specimen can be broken with single firm blow of geological hammer.	12.5-25		
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen on a solid surface can be fractured with single firm blow of geological hammer.	25-50	<i>Medium Strong (25-50)</i>	<i>Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.</i>
Strong	Specimen requires more than one blow of geological hammer to fracture it.	50-100	<i>Strong (50-100)</i>	<i>Requires more than one blow of geological hammer to fracture.</i>
Very Strong	Specimen requires many blows of geological hammer to fracture it.	100-250	<i>Very Strong (100-250)</i>	<i>Requires many blows of geological hammer to fracture.</i>
Extremely strong	Specimen can only be chipped with geological hammer.	>250	<i>Extremely strong (<250)</i>	<i>Can only be chipped with geological hammer.</i>
Based on BS EN ISO 14689-1 4.2.7, Table 2			Based on BS EN ISO 14689-1:2003 4.2.7, Table 5 (Superseded Version)	

KEY SHEETS TABLE 3

- 5 Where 'rock weathering classification' can be applied it is 'Approach 4' which will be used. If any other approach is used the factual text of the report will provide details of the applicable specific approach. (Ref.: BS5930). An outline of the 'Approach 4' rock weathering classification scheme is provided as Key Sheets Table 4.

APPROACH 4 CLASSIFICATION INCORPORATING MATERIAL AND MASS FEATURES		
Class	Classifier	Typical characteristics
A	Unweathered	Original strength, colour, fracture spacing
B	Partially weathered	Slightly reduced strength, slightly closer fracture spacing, weathering penetrating in from fractures, brown oxidation
C	Distinctly weathered	Further weathered, much closer fracture spacing grey reduction
D	Destructured	Greatly weakened, mottled, ordered lithorelics in matrix becoming weakened and disordered, bedding disturbed.
E	Residual or reworked	Matrix with occasional altered random or 'apparent' lithorelics, bedding destroyed. Classed as reworked when foreign inclusions are present as a result of transportation.

KEY SHEETS TABLE 4



Allied Exploration and Geotechnics Limited

Key Sheets



Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Boring Progress and Water Observations Columns

This section provides information on each day's production as a daily log.

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Casing Dia	Casing's diameter at the start of the shift.
Water Depth	Water level within the borehole at the start and end of shift.

Chiselling Columns

Indicates where hard strata occurred in the borehole and breaking out was carried out to advance the borehole.

From	The depth commenced.
To	The depth finished.
Hours	The time spent for breaking out.

Water Added Columns

Indicates the depth range where water was added to the borehole to facilitate boring or to prevent stress relief disturbance "blowing/boiling" in granular soils.

From	Depth in metres from where water was added.
To	Depth in metres to where water was added.

General Remarks

Any remarks believed to be relevant to the exploratory hole.

INFORMATION RELEVANT TO PIT/TRENCH RECORDS

The pit/trench records follow the same format as the borehole and window/windowless sample hole records for the Samples & Tests, Water and Strata columns. However, in addition to these there are the following:

Plan

A schematic plan view of the pit showing its excavated dimensions together with its orientation, given as a compass bearing to magnetic north.

Groundwater

Notes on water bearing horizons.

Stability

The engineer's comments outlining the stability of the sides during pit excavation.

General Remarks

The engineer's comments of any other information relevant to construction of the pit.

Additional Information

An indication if a sketch and/or photographs accompany the record.



Allied Exploration and Geotechnics Limited

Key Sheets



Underground Services

Depth	Depth service was encountered.
Orientation	Orientation given as a compass bearing to magnetic north.
Type	Type of service encountered.
Diameter	Diameter of service encountered.
Condition	Condition the service encountered was noticed in.

INFORMATION RELEVANT TO DRILLHOLE RECORDS AND ROTARY CONTINUATION

Run Details Columns

Depth	Each drill run is highlighted by a horizontal line with the top and bottom depths shown in metres. Core diameter (C Dia) is presented also within each run.
TCR (SCR) RQD	Information provided on the total core recovery, solid core recovery and rock quality designation. Refer to Abbreviations for further details.
Fracture Index	Information given relating to the fracture index of the rock.

Strata Columns

As the strata columns for borehole and window/windowless sample hole records except for description which is as follows:

Discontinuities Detail	Information on core discontinuities, localised variations in weathering, lithology, strength and structure follows recommendations outlined in BS5930.
Main	Engineering description of each individual soil or rock type follows recommendations outlined in BS5930.

Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Drilling Progress and Water Observations Columns

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Water Strike	Depth at which water was encountered.
Water Standing	Depth at which water in the hole levelled off.
Water Remarks	Any remarks believed to be relevant to the water e.g. Artesian.

Standard Penetration Test

Depth	The depth commenced.
Type	Type of standard penetration test (SPT).
Result	Result of SPT.

Flush

From	The depth commenced.
To	The depth finished.
Type	Details of the type of flush used. A = Air, F = Foam, W = Water and Pol = Polymer.
Returns	An indication of the percentage of the returned flush material.

General Remarks

Any remarks believed to be relevant to the exploratory hole.



Allied Exploration and Geotechnics Limited

Key Sheets



SAMPLES

B	Bulk disturbed sample.
ES	Environmental soil sample.
EW	Environmental water sample.
G	Gas sample.
J	Small disturbed sample.
LB	Large bulk disturbed sample.
P	Piston sample.
P*	An attempted but failed undisturbed piston sample.
U	Undisturbed sample.
U*	An attempted but failed general purpose undisturbed sample.
U _(ss)	Sample has been subsampled.
ES _(U)	Brackets following a sample denotes a subsample. The sample information within the brackets is the origin of the subsample.
W	Water sample.

IN-SITU TESTS

CBR	California Bearing Ratio mould sample or test.
HSV	In-situ hand shear vane.
HSV*	An attempted but failed in-situ hand shear vane.
HSV result of e.g. 80(20)kPa	Denotes average HSV peak result followed by average HSV residual result (in brackets).
HP	Hand penetrometer test.
K (F)	Falling head permeability test.
K (R)	Rising head permeability test.
K (C)	Constant head permeability test.
K (P)	Packer permeability test.
PT	Pressuremeter test.
PID	Photo ionisation detector test.
FID	Flame ionisation detector test.
S	Standard Penetration Test (SPT) using the split barrel sampler (shoe). The corresponding uncorrected 'N' value is given in the test result column with more detailed information provided in the In-Situ Testing Enclosures where applicable. Testing has been conducted in accordance with BS EN ISO 22476-3.
C	Denotes SPT test using a solid cone in preference to the split barrel sampler (usually in coarse granular soil) with all other reporting requirements as outlined above for the split barrel sampler.
S/C result of e.g. 1/2.94	Denotes where full penetration has not been achieved during the SPT test. In such cases the penetration (mm) per blow is recorded in the test result column e.g. 1/2.94 is 2.94mm of penetration per single blow.
SV	In-situ down-the-hole shear vane test. The remoulded shear strength is given in brackets.

ROCK QUALITY AND CORE RECOVERY

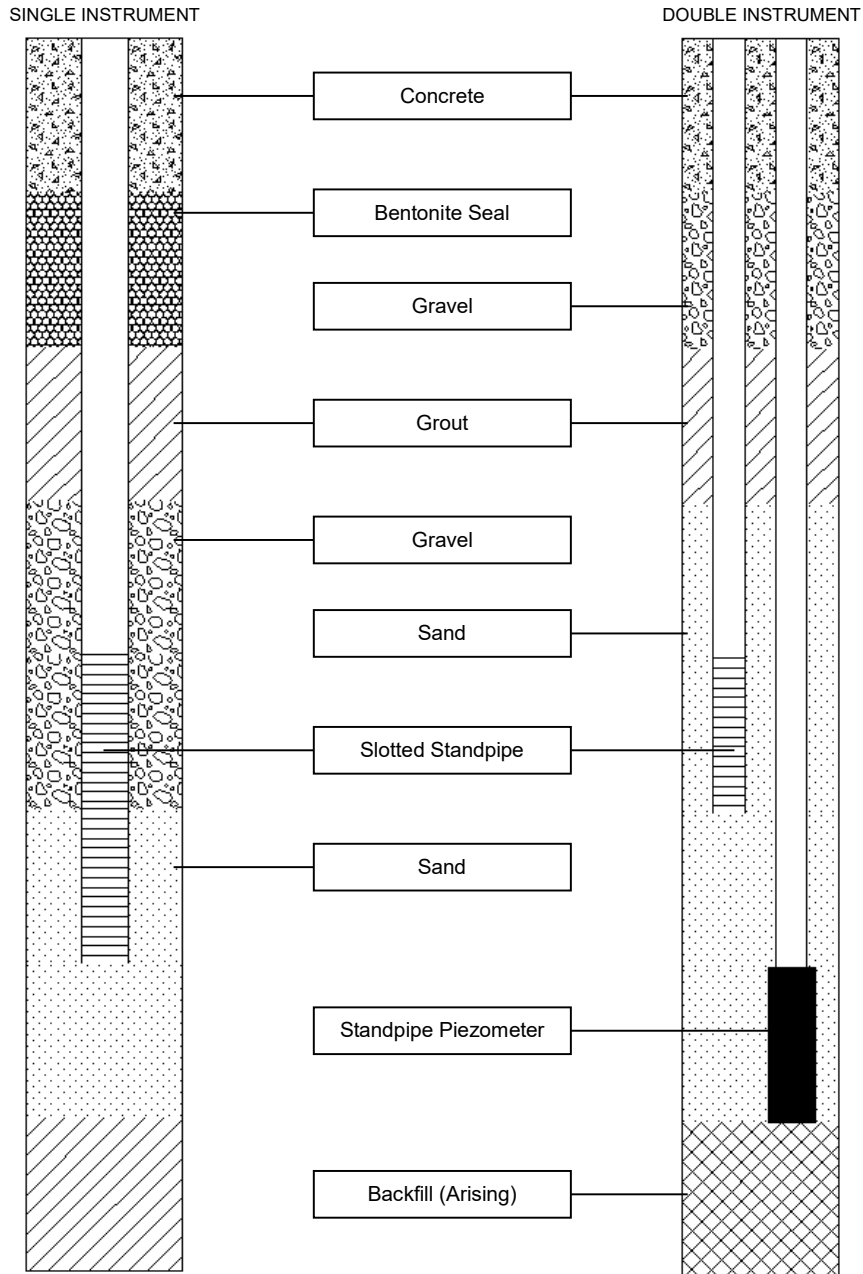
TCR	Total Core Recovery - the length of the recovered core expressed as a percentage of the length of core run.
SCR	Solid Core Recovery - the sum length of all core pieces that are recovered with at least one full diameter, expressed as a percentage of the length of core run.
RQD	Rock Quality Designation - The sum length of all core pieces that are 100mm or longer (measured along the centre of the core), expressed as a percentage of the length of core run.
FI	Fracture Index - The number of fractures per 1000mm length of solid core.
NI	Non-intact - The material recovered in a non-intact state.
NR	No recovery from the core run. These zones are based on the interpretation of the logging engineer and are therefore potentially subjective.



Allied Exploration and Geotechnics Limited Key Sheets



Symbols and Abbreviations: Explanation of Instrumentation Legends Used





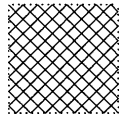
Allied Exploration and Geotechnics Limited

Key Sheets



Symbols and Abbreviations: Explanation of Legends Used

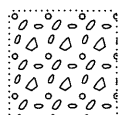
Soils	Rocks		
	<i>Sedimentary</i>	<i>Metamorphic</i>	<i>Igneous</i>



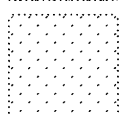
Made Ground



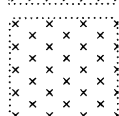
Cobbles and Boulders



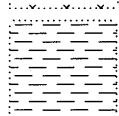
Gravel



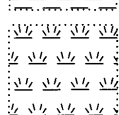
Sand



Silt



Clay

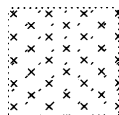


Peat

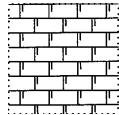


Topsoil

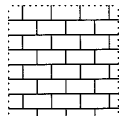
Note: Composite soil types will be signified by combined symbols e.g.



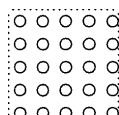
Silty Sand



Chalk



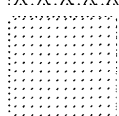
Limestone



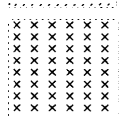
Conglomerate



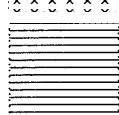
Breccia



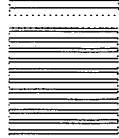
Sandstone



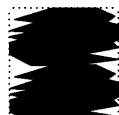
Siltstone



Mudstone



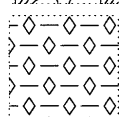
Shale



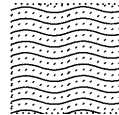
Coal



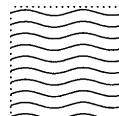
Pyroclastic
(Volcanic Ash)



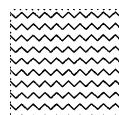
Gypsum



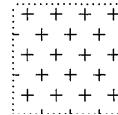
Coarse
Grained



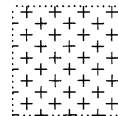
Medium
Grained



Fine Grained



Coarse
Grained



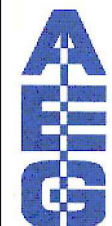
Medium
Grained



Fine Grained

Exploratory Hole Location Plan





Allied Exploration and Geotechnics Limited
 Unit 25 Stella Gill Industrial Estate
 Pelton Fell
 Chester - Le - Street
 Co Durham
 DH2 2RG
 (Tel): 0191 387 4700
 (Fax): 0191 387 4710
 (Email): enquiries@aeg.uk.net

KEY:



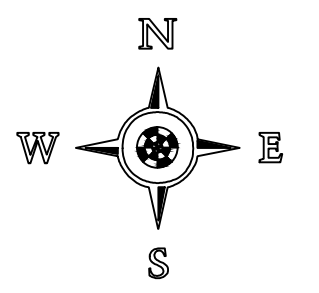
BOREHOLE



WINDOW/WINDOWLESS SAMPLE HOLE



TRIAL/INSPECTION PIT



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG/4322B/OVERVIEW

Contract Title:

A66 North Trans Pennine Scheme C Section 11

Client:

AMEY OW Limited
 Chancery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

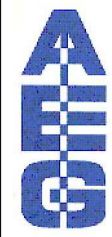
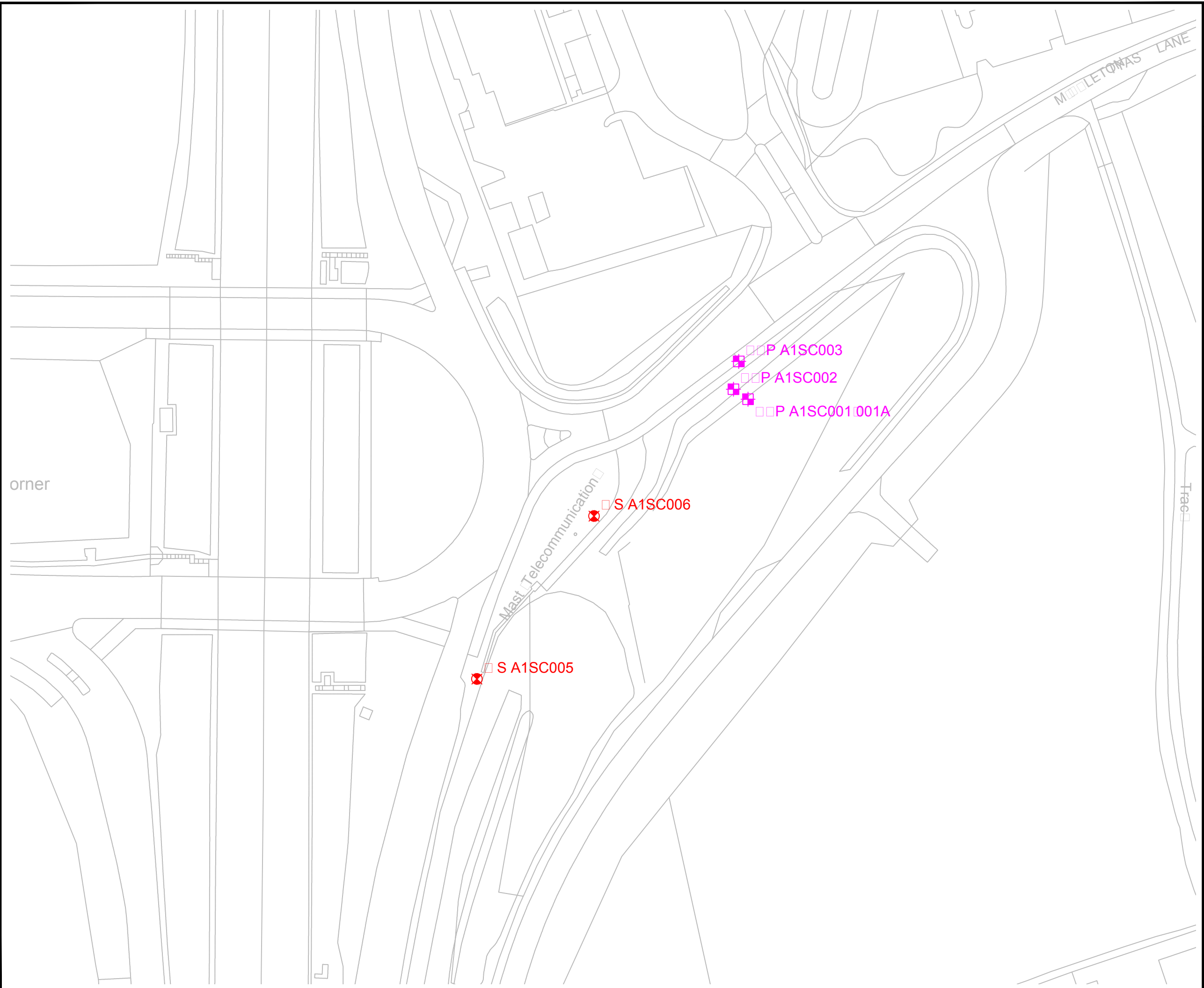
4322B

Scale:

1:10000 @ A3

Date:

01/09/2021

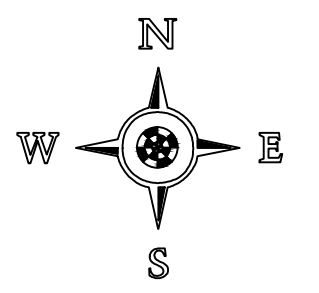


Allied Exploration and Geotechnics Limited
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 (Email): enquires@aeg.uk.net

KEY:



BOREHOLE
 WINDOW/WINDOWLESS SAMPLE HOLE
 TRIAL/INSPECTION PIT



Base Plan Supplied by Consulting Engineer

Drawing Title:
 ENC 01 : Exploratory Hole Location Plan

Drawing No.:
 AEG/4322B/01

Contract Title:
 A66 North Trans Pennine Scheme C Section 11

Client:
 AMEY OW Limited
 Chancery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:
 Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:
 4322B

Scale:
 1:1000 @ A3

Date:
 22/03/2021

Window/Windowless Sample Hole Records





ALLIED EXPLORATION & GEOTECHNICS LIMITED

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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. WS A1SC005	
Client: AMEY OW Limited	Location: E:421658.092 N:505228.673		
Method (Equipment): Window Sampling (PC Tracker S110)	Ground Level (m): 141.845	Start Date: 16/03/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1			141.55		0.30	MADE GROUND (Blackish brown sandy topsoil. Mild hydrocarbon odour noted).	
0.40	J2						MADE GROUND (Soft to firm dark brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, macadam, roadstone and clinker. Mild hydrocarbon odour noted).	
0.60-0.80	B3							
1.00	ES4					(2.50)	at c.1.20m BGL ... clay is of intermediate plasticity.	
1.20-1.65	SJ5	N12						
1.50	J6						at c.2.80m BGL ... (1) obstruction. Terminated at 2.80m BGL - due to an obstruction.	
1.80-2.00	B7							
2.00	ES8							
2.00-2.45	SJ9	N14						
2.20-2.80	U*B10	(100)		139.05		2.80		

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
16/03/2021	0.00				2.20 - 2.80	87	0	No	
16/03/2021	2.80			Dry					

All dimensions in metres Scale 1:50.00
 For explanation of symbols and abbreviations see Key Sheets
 Checked by: *K.W.*
 Logged by: M. Bell
 Contract No. **4322B**



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 Regional Office: Unit 20 Business Development Centre, Eaman Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. WS A1SC006	
Client: AMEY OW Limited	Location: E:421691.197 N:505274.734		Sheet: 1 of 4
Method (Equipment): Window Sampling (PC Tracker S110)	Ground Level (m): 142.501	Start Date: 16/03/2021	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1						MADE GROUND (Blackish brown sandy gravelly topsoil. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, macadam, roadstone and clinker. Mild hydrocarbon odour noted). at c.0.40m BGL ... clay is of low plasticity.	
0.40	J2					(1.20)		
0.60-0.80	B3							
1.00	ES4			141.30		1.20	MADE GROUND (Blackish brown sand and gravel. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, macadam, roadstone and clinker. Mild hydrocarbon odour noted). at c.1.20m BGL ... medium dense.	
1.20-2.20	U6 _(SS)	(75)				(0.70)		
1.20-1.90	B7 _(U6)	N29					MADE GROUND (Grey mottled orangish brown very clayey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, macadam, roadstone and clinker. Mild hydrocarbon odour noted). at c.2.20m BGL ... medium dense.	
1.20-1.65	SJ5							
1.50	J8 _(U6)			140.60		1.90	MADE GROUND (Firm to stiff mottled blue dark brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and limestone. Mild hydrocarbon odour noted).	
1.90-2.20	ES9 _(U6)					(0.75)		
2.20-3.20	U11 _(SS)	(115)					MADE GROUND (Firm to stiff mottled blue dark brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and limestone. Mild hydrocarbon odour noted).	
2.20-2.90	B12 _(U11)	N26						
2.20-2.65	SJ10			139.85		2.65	MADE GROUND (Blackish grey clayey sand and gravel with low cobble content. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes roadstone and macadam. Cobbles are angular and of limestone. Mild hydrocarbon odour noted).	
2.70	J13 _(U11)							
2.90-3.20	ES14 _(U11)						MADE GROUND (Firm to stiff yellowish black very sandy slightly gravelly clay. Sand is fine to coarse. Gravel is fine to coarse angular to subangular and includes roadstone and macadam. Mild hydrocarbon odour noted). at c.5.20m BGL ... clay is of intermediate plasticity.	
3.20-4.20	U16 _(SS)	(80)				(2.05)		
3.20-3.90	B17 _(U16)	N31					Complete at 6.65m BGL.	
3.20-3.65	SJ15							
3.70	J18 _(U16)						Complete at 6.65m BGL.	
3.90-4.20	ES19 _(U16)							
4.20-5.20	U21 _(SS)	(85)					Complete at 6.65m BGL.	
4.20-4.90	B22 _(U21)	N31						
4.20-4.65	SJ20			137.80		4.70	Complete at 6.65m BGL.	
4.70	J23 _(U21)							
4.90-5.20	ES24 _(U21)			137.50		5.00	Complete at 6.65m BGL.	
5.20-6.20	U26 _(SS)	(100)						
5.20-5.90	B27 _(U26)	N40					Complete at 6.65m BGL.	
5.20-5.65	SJ25							
5.70	J28 _(U26)					(1.65)	Complete at 6.65m BGL.	
5.90-6.20	ES29 _(U26)							
6.20-6.65	SJ30	N46		135.85		6.65	Complete at 6.65m BGL.	

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
16/03/2021	0.00			Dry	1.20 - 2.20	87	100	Yes	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
16/03/2021	6.65				2.20 - 3.20	87	100	Yes	
					3.20 - 4.20	77	100	Yes	
					4.20 - 5.20	77	100	Yes	
					5.20 - 6.20	77	100	Yes	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>K.W.</i>	Logged by: M. Bell	Contract No. 4322B
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ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project:	A66 North Trans Pennine Scheme C Section 11			Exploratory Hole No. WS A1SC006			
Client:	AMEY OW Limited	Location:	E:421691.197 N:505274.734				
Method (Equipment):	Window Sampling (PC Tracker S110)	Ground Level (m):	142.501	Start Date:	16/03/2021	Sheet:	2 of 4

Figure WS A1SC006.1
WS A1SC006 - 1.20-2.20m BGL



Figure WS A1SC006.2
WS A1SC006 - 2.20-3.20m BGL





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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

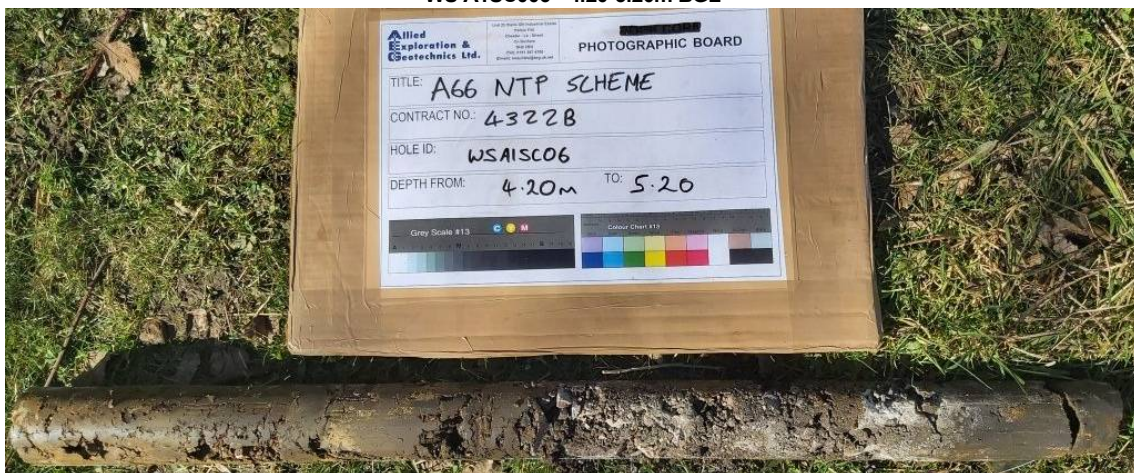
Status:-
FINAL

Project:	A66 North Trans Pennine Scheme C Section 11			Exploratory Hole No. WS A1SC006			
Client:	AMEY OW Limited	Location:	E:421691.197 N:505274.734				
Method (Equipment):	Window Sampling (PC Tracker S110)	Ground Level (m):	142.501	Start Date:	16/03/2021	Sheet:	3 of 4

Figure WS A1SC006.3
WS A1SC006 - 3.20-4.20m BGL



Figure WS A1SC006.4
WS A1SC006 - 4.20-5.20m BGL





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Tel: 01772 735 300 Fax: 01772 735 999

WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11			Exploratory Hole No. WS A1SC006
Client: AMEY OW Limited	Location: E:421691.197 N:505274.734		
Method (Equipment): Window Sampling (PC Tracker S110)	Ground Level (m): 142.501	Start Date: 16/03/2021	Sheet: 4 of 4

Figure WS A1SC006.5
WS A1SC006 - 5.20-6.20m BGL



Inspection Pit Records





ALLIED EXPLORATION & GEOTECHNICS LIMITED

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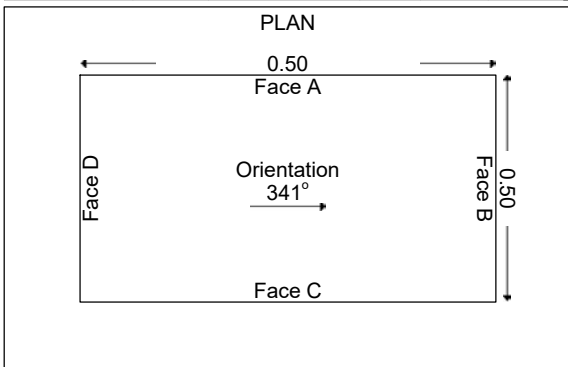
Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC001	
Client: AMEY OW Limited		Location: E:421734.726 N:505307.781	
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 138.991	Start Date: 11/03/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
				138.79		0.20	MADE GROUND (Soft dark brown slightly sandy slightly gravelly clay with many rootlets, ceramic tile and plastic fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, limestone, dolomite and brick).
				138.49		0.50	
				138.39		0.60	
							MADE GROUND (Soft orange brown mottled grey slightly sandy gravelly clay with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and limestone).
							MADE GROUND (Grey slightly sandy gravel. Sand is coarse. Gravel is medium subrounded and includes sandstone and limestone). at c.0.60m BGL ... 200mm diameter ribbed and perforated plastic drainage pipe (aligned 341 degrees). <i>Terminated at 0.60m BGL - due to encountering a service.</i>



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>K.W.</i>	Logged by: J. Myall	Contract No. 4322B
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Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC001	
Client: AMEY OW Limited	Location: E:421734.726 N:505307.781		Sheet: 2 of 3
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 138.991	Start Date: 11/03/2021	

Figure HDP A1SC001.1
HDP A1SC001



Figure HDP A1SC001.2
HDP A1SC001





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Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11			Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:421734.726 N:505307.781		HDP A1SC001
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 138.991	Start Date: 11/03/2021	Sheet: 3 of 3

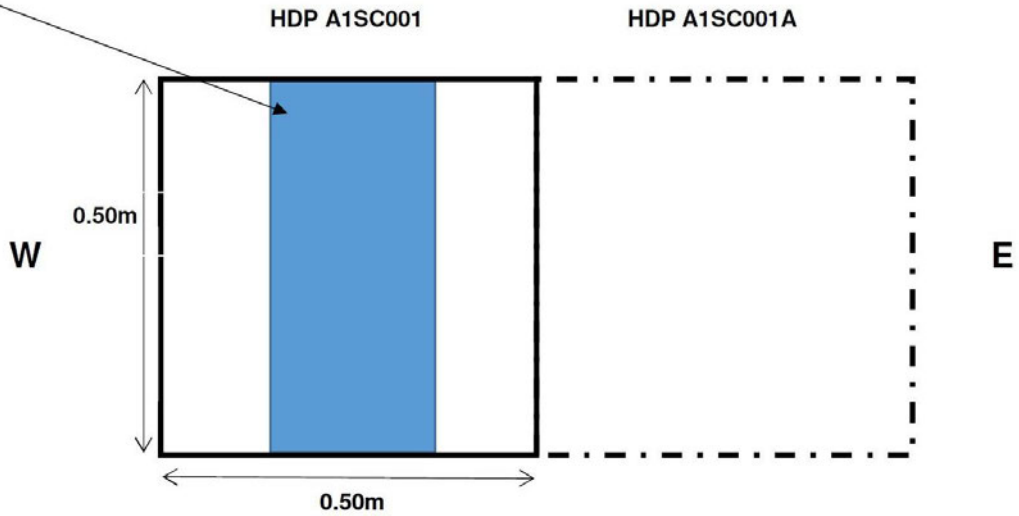
Figure HDP A1SC001.3
HDP A1SC001

Service: Ribbed and perforated plastic drainage pipe

Depth: 0.60m BGL

Orientation: 341°

Diameter: 200mm





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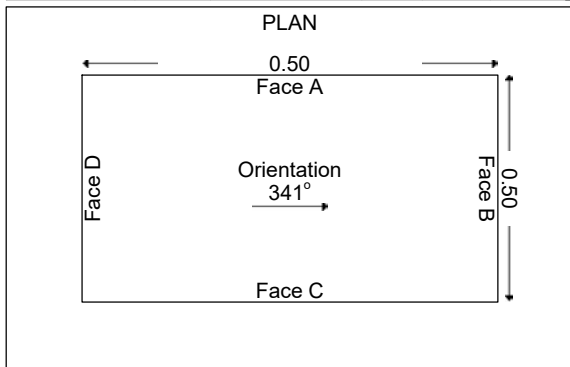
Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC001A	
Client: AMEY OW Limited		Location: E:421734.726 N:505307.781	
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 138.991	Start Date: 11/03/2021
		Sheet: 1 of 2	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.25 0.30	J1 J2 ES3			138.79	[Cross-hatched pattern]	0.20	MADE GROUND (Soft dark brown slightly sandy slightly gravelly clay with many rootlets, ceramic tile and plastic fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, limestone, dolomite and brick).
0.80-1.00 1.00	B4 ES5			137.79		1.00 1.20	MADE GROUND (Soft orange brown mottled grey slightly sandy gravelly clay with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and limestone). <i>Complete at 1.20m BGL.</i>



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Myall	Contract No. 4322B
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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC001A	
Client: AMEY OW Limited	Location: E:421734.726 N:505307.781		Sheet: 2 of 2
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 138.991	Start Date: 11/03/2021	

Figure HDP A1SC001A.1
HDP A1SC001A



Figure HDP A1SC001A.2
HDP A1SC001A





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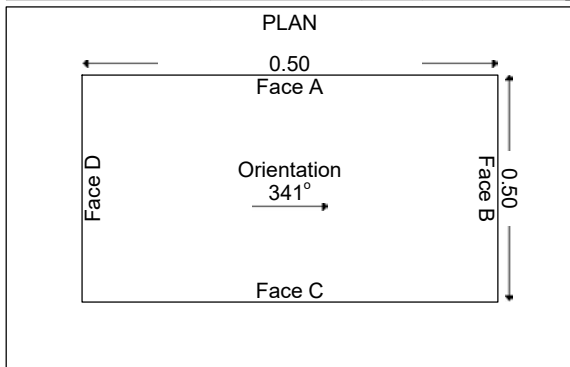
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC002	
Client: AMEY OW Limited		Location: E:421730.611 N:505310.598	
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 139.630	Start Date: 11/03/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20 0.30	J1 ES2 J3			139.38	[Cross-hatched pattern]	0.25	MADE GROUND (Soft dark brown slightly sandy slightly gravelly clay with many rootlets, ceramic tile and plastic fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, limestone, dolomite and brick). at c.0.10m BGL ... clay is of intermediate plasticity. at c.0.25m BGL ... black membrane.
0.80-1.00 1.00	B4 ES5			138.43		1.20	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Myall	Contract No. 4322B
---	---	------------------------	------------------------------



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC002	
Client: AMEY OW Limited	Location: E:421730.611 N:505310.598		Sheet: 2 of 3
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 139.630	Start Date: 11/03/2021	

Figure HDP A1SC002.1
HDP A1SC002



Figure HDP A1SC002.2
HDP A1SC002





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Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC002	
Client: AMEY OW Limited	Location: E:421730.611 N:505310.598		Sheet: 3 of 3
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 139.630	Start Date: 11/03/2021	

Figure HDP A1SC002.3
HDP A1SC002





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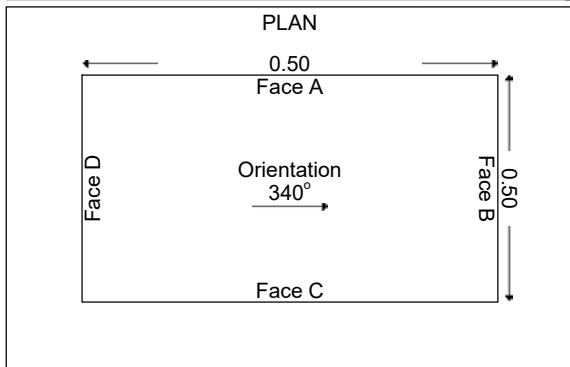
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INSPECTION PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No. HDP A1SC003	
Client: AMEY OW Limited		Location: E:421732.108 N:505318.458	
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 141.170	Start Date: 11/03/2021
		Sheet: 1 of 2	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1	39 (20)kPa		140.92		0.25	MADE GROUND (Soft dark brown slightly sandy slightly gravelly clay with many rootlets, ceramic tile and plastic fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, limestone, dolomite and brick).
0.20	ES2			(0.95)		1.20	MADE GROUND (Soft orange brown mottled grey slightly sandy gravelly clay with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and limestone).
0.30	HSV						Complete at 1.20m BGL.
0.50	J3						
0.80-1.00	B4						
1.00	ES5						



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Below 0.40m unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Myall	Contract No. 4322B
---	---	------------------------	-----------------------



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Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme C Section 11		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:421732.108 N:505318.458		HDP A1SC003
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 141.170	Start Date: 11/03/2021	Sheet: 2 of 2

Figure HDP A1SC003.1
HDP A1SC003



Figure HDP A1SC003.2
HDP A1SC003



In-situ Test Report Certificate



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IN-SITU TESTING REPORT CERTIFICATE



1367

Contract Title: A66 North Trans Pennine Scheme C
Section 11

AEG Reference: 4322B

Client Address: AMEY OW Limited
Chancery Exchange
10 Furnival Street
London
EC4A 1AB

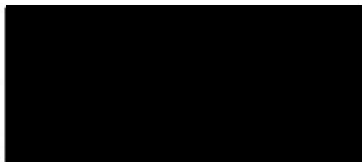
I certify that *In-situ* testing was carried out on the above contract in accordance with techniques outlined in BS 1377: 1990: Part 9 or other appropriate standards as quoted, and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Managing Director)
 Kerry Wade (Technical Manager)

Signed



Date: 11 May 2021

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation

IN-SITU TESTING REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Test Report Certificate	N/A		2
1	Standard Penetration Test Results (SPT)	Yes	BS 1377 Part 9 1990	4
2	Hand Shear Vane Test Results	No		1
-	Variable Head Permeability Test Results	No	BS 5930 1999:Section 4	-
-	<i>In-situ</i> Water Quality Parameter Test Results	No		-
-	Density by Sand Replacement Method	Yes	BS 1377 Part 9 1990	-
-	Density by Core Cutter Method	Yes	BS 1377 Part 9 1990	-
-	Determination of the Vane Shear Strength (Down the Hole)	Yes	BS 1377 Part 9 1990	-
-	Shallow Pad (skip) Load Test Results	No	BS 1377 Part 9 1990	-
-	Determination of the California Bearing Ratio	Yes	BS 1377 Part 9 1990	-
-	Plate Loading Test Results	No	BS 1377 Part 9 1990	-
-	Apparent Resistivity of Soil	No	BS 1377 Part 9 1990	-
-	Redox Potential of Soil	No	BS 1377 Part 9 1990	-
-	Determination of the Soil Infiltration Rate for Soakaway Design	No	BRE Digest 365:1991	-

Standard Penetration Test Results




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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ret.	Energy Ratio E _s %	SEATING DRIVE								TEST DRIVE								Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N ₆₀	Shoe or Cone		Remarks			
						Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm	No.	Blows	Pen mm					No.	SIC				
WS A1SC005	1.20 (140.65)	Dry	1.20	DP04	73	75	2	75	3	3	75	3	75	3	75	3	75	3	75	3	75	3	300	12	10	12	25.00	12	10	S	
WS A1SC005	2.00 (139.85)	Dry	2.00	DP04	73	75	3	75	3	3	75	3	75	3	75	3	75	3	75	3	75	3	300	14	12	14	21.43	14	12	S	
WS A1SC006	1.20 (141.30)	Dry	1.20	DP04	73	75	4	75	5	5	75	6	75	5	75	5	75	6	75	8	75	10	300	29	23	29	10.34	29	23	S	
WS A1SC006	2.20 (140.30)	Dry	2.20	DP04	73	75	4	75	4	4	75	4	75	4	75	4	75	5	75	7	75	8	300	26	22	26	11.54	26	22	S	
WS A1SC006	3.20 (139.30)	Dry	3.20	DP04	73	75	6	75	7	7	75	7	75	5	75	5	75	5	75	9	75	10	300	31	28	31	9.68	31	28	S	
WS A1SC006	4.20 (138.30)	Dry	4.20	DP04	73	75	4	75	5	5	75	5	75	6	75	6	75	6	75	9	75	11	300	31	29	31	9.68	31	29	S	
WS A1SC006	5.20 (137.30)	Dry	5.20	DP04	73	75	7	75	7	7	75	9	75	8	75	8	75	9	75	14	75	14	300	40	40	40	7.50	40	40	S	
WS A1SC006	6.20 (136.30)	Dry	6.20	DP04	73	75	7	75	9	9	75	9	75	10	75	10	75	11	75	16	75	16	300	46	48	46	6.52	46	48	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme C Section 11	Client :-	AMEY OW Limited	AEG Contract No. :-	4322B
	Date of Issue :-	11/05/2021	Checked	Page No. :-	1 of 1	Certificate No. :-



ALLIED EXPLORATION & GEOTECHNICS LIMITED

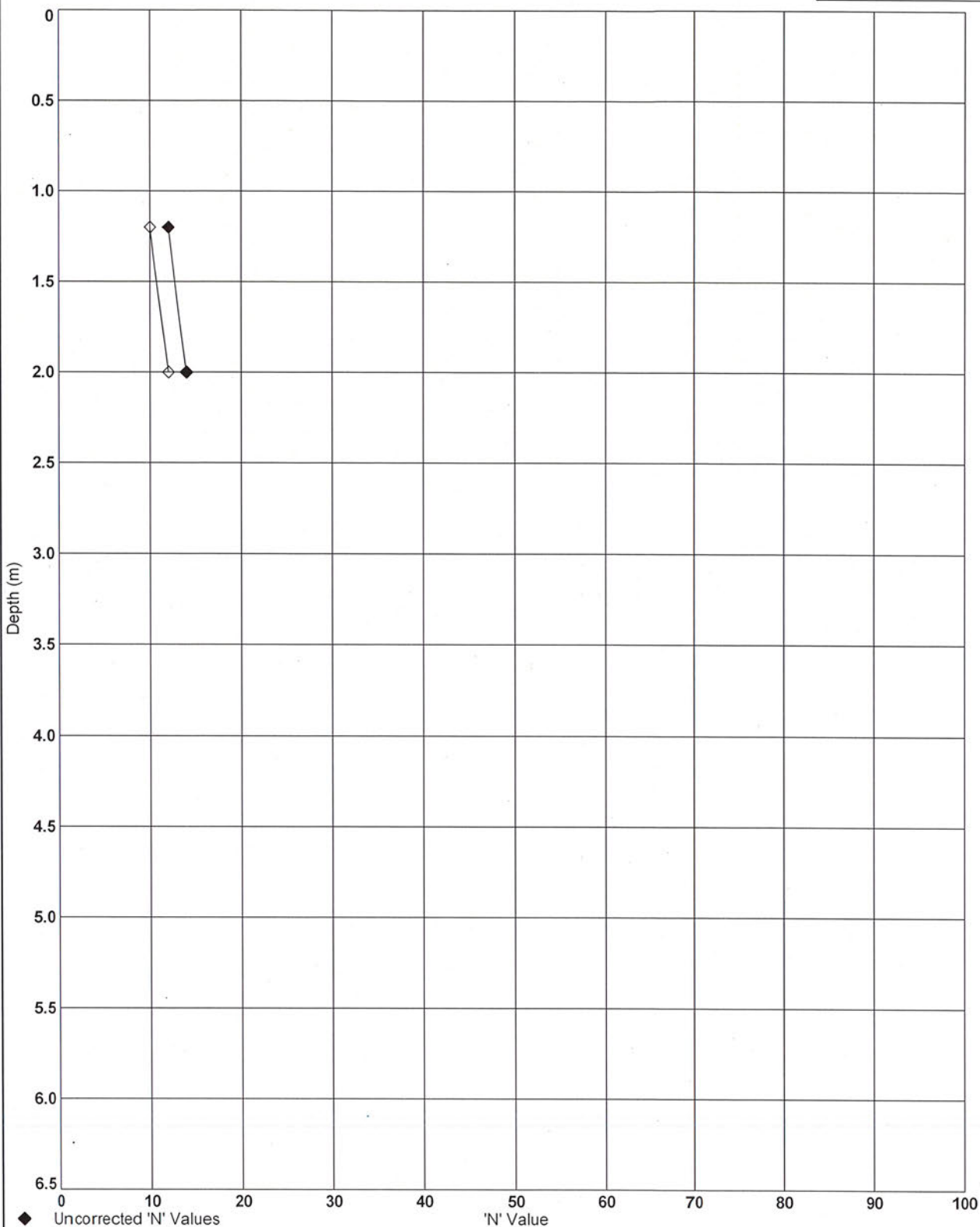
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

WS A1SC005



Contract Title :-
 A66 North Trans Pennine Scheme C Section 11

Client :-
 AMEY OW Limited



Date of issue :-
 11/05/2021

Certificate No :-
 SPT/4322B/Graph/W5 A1SC005

Operator :-
 L. Selkirk



Checked: [Redacted]

AEG Contract No. :-
 4322B

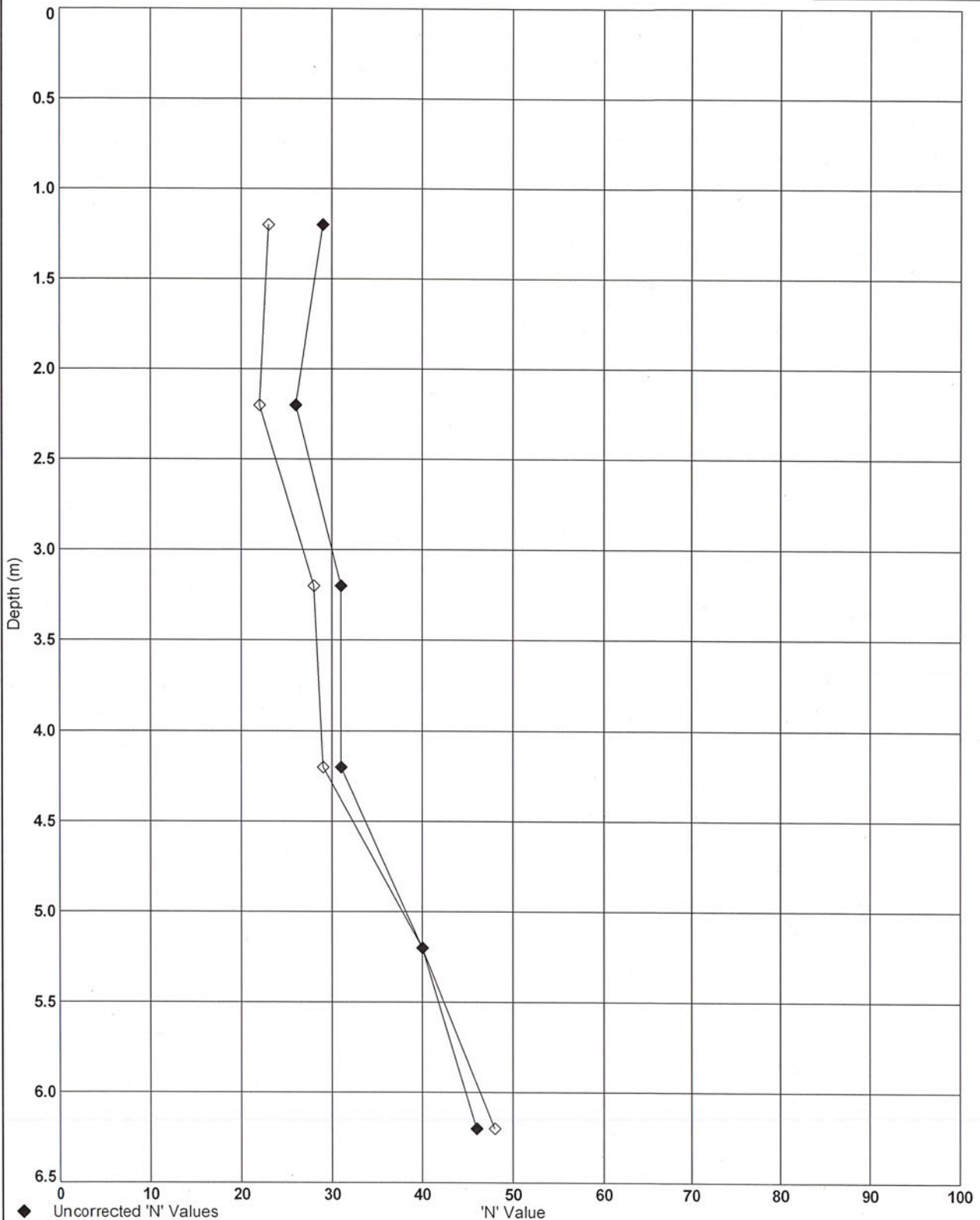
ALLIED EXPLORATION & GEOTECHNICS LIMITED

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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

WS A1SC006



Contract Title :-
A66 North Trans Pennine Scheme C Section 11

Client :-
AMEY OW Limited



Date of issue :-
11/05/2021

Certificate No :-
SPT/4322B/Graph/W5 A1SC006

Operator :-
L. Selkirk

Checked By :- [Redacted]

AEG Contract No. :-
4322B



Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: DP04
Test Date: 08/07/2020
Report Date: 14/07/2020
File Name: DP04.spt
Test Operator: BP

QUALITY CONTROL
CHECKED

03 AUG 2020

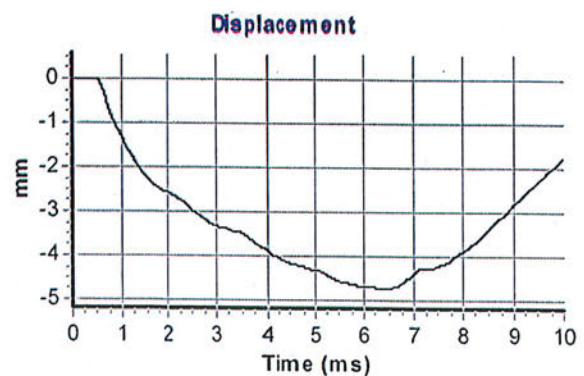
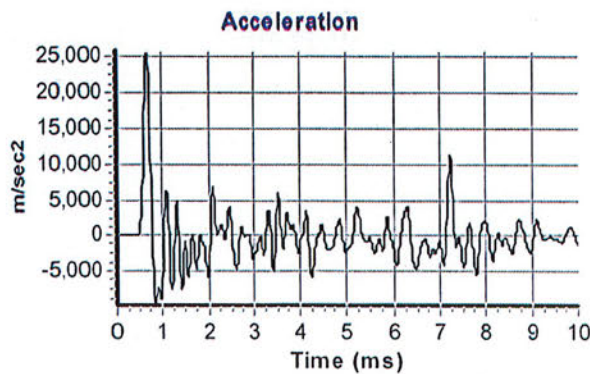
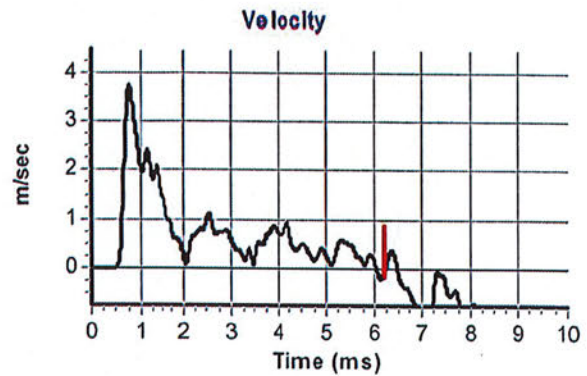
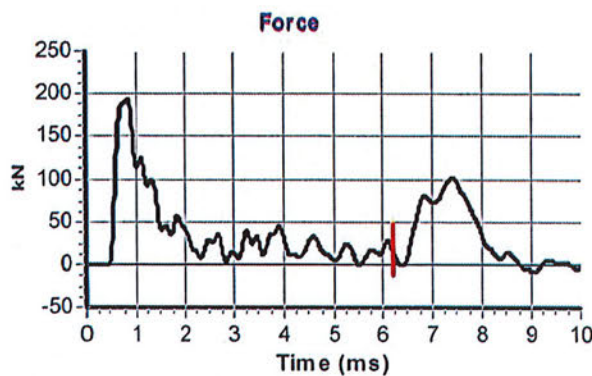
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11948
Accelerometer No.2: 6469

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm^2): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 346

Energy Ratio E_r (%): 73

Signed: Brian Proctor
Title: Senior Technician

The recommended calibration interval is 12 months

Hand Shear Vane Test Results




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HAND SHEAR VANE TEST RESULTS

Exploratory Hole No.	Date	Depth m	1st Result kPa	2nd Result kPa	3rd Result kPa	Average kPa	Remarks
HDP A1SC003	12/03/2021	0.30	41 (22)	38 (19)	39 (18)	39 (20)	

Residual results given in brackets.

	Contract Title :-	A66 North Trans Pennine Scheme C Section 11	Client :-	AMEY OW Limited	AEG Contract No. :-	4322B
	Date of Issue :-	11/05/2021	Checked	Certificate No. :- HSV/4322B/1		
Page No. :-		1 of 1				

Laboratory Report Certificate



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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LABORATORY REPORT CERTIFICATE



Contract Title: A66 North Trans Pennine Scheme C
Section 11

AEG Reference: 4322B

Client Address: AMEY OW Limited
Chancery Exchange
10 Furnival Street
London
EC4A 1AB

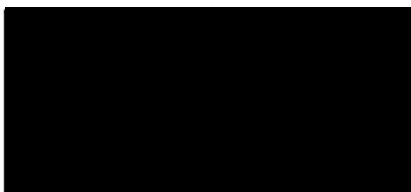
We certify that Laboratory testing was carried out on samples from the above contract in accordance with techniques outlined in BS 1377: 1990, BS EN ISO 17892:2014 or other appropriate standards as quoted. The samples were received from March 2021 and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Managing Director)
- Kevin Warriner (HSE & Quality Director)
- Michelle Selkirk (Laboratory Manager)

Signed



Date: 19 April 2021

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

Please note the material was derived from samples taken outside the control of the laboratory.

LABORATORY REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Laboratory Report Certificate	N/A		3
1	Sample Description Sheets	N/A		1
2	Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	1
2	Plasticity Index and Moisture Content	Yes	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)	1
3	Determination of Particle Density	Yes	BS 1377 Part 2 1990	1
4	Particle Size Distribution Sieving	Yes	BS 1377 Part 2 1990	3
4	Particle Size Distribution Sedimentation	No	BS 1377 Part 2 1990	3
5	Determination of California Bearing Ratio	Yes	BS 1377 Part 4 1990	1

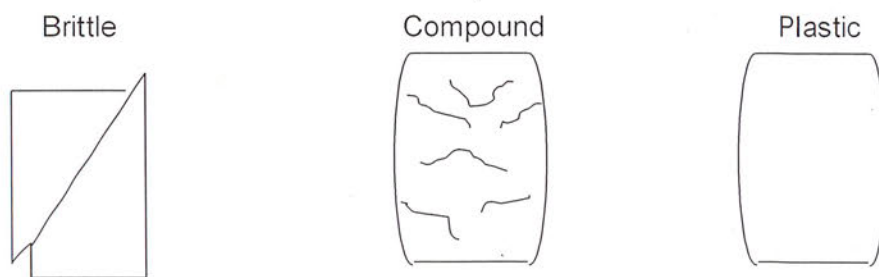
LABORATORY REPORT CERTIFICATE

ABBREVIATIONS

All the abbreviations used on the laboratory certificates are given below:

Br	Brittle	PSD	Particle Size Distribution by sieve analysis
C	Compound	SB	Shear Box
CBR	California Bearing Ratio	SED	Sedimentation Analysis
CDT	Consolidated Drained Triaxial	SO4	Sulphate (total, water extract, groundwater)
CL	Chloride content (water or soil)	CP2	Dry Density/Moisture Content 2.5kg rammer
US	Unsuitable sample for test	CP4	As above using 4.5kg rammer
UUT	Undrained Unconsolidated Triaxial	CPV	As above using vibrating hammer
HSV	Vane Test	CUT	Consolidated Undrained Triaxial
IS	Insufficient sample for test	R	Remoulded
LOI	Loss On Ignition	U	Undisturbed
M	Multi-stage testing	MC	Moisture Content
MCV	Moisture Content Value	PL	Point Load
NAT	Natural preparation method	NMC	Natural (or as received) moisture content
P	Plastic	PFH	Permeability Falling Head Method
OED	Oedometer	PTXL	Permeability in Triaxial Cell
OMC	Optimum Moisture Content	ORG	Organic content
B	Large disturbed (bulk) sample	PD	Particle Density (SG)
J	Small disturbed (jar) sample	PI	Liquid limit, plastic limit and plasticity index

Typical Mode of Failure for Triaxial Testing



Sample Description Sheets



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth (m) ID	Description	Laboratory Tests/Remarks
HDP A1SC002	0.10 J1	Brown sandy gravelly CLAY of intermediate plasticity.	MC PI
HDP A1SC002	0.30 J3	Brown sandy gravelly CLAY of low plasticity with occasional rootlets.	MC PI
HDP A1SC002	0.80 B4	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.	PSD SED PD CBR IS for CP4 and MCV
WS A1SC005	0.60 B3	MADE GROUND(Brown slightly sandy slightly gravelly clay).	PSD SED
WS A1SC005	1.20 J5	MADE GROUND (Brown sandy gravelly clay of intermediate plasticity).	MC PI
WS A1SC006	0.40 J2	MADE GROUND (Brown sandy gravelly clay of low plasticity. Gravel includes ash and brick fragments).	MC PI
WS A1SC006	2.20 J10	MADE GROUND (Brown sandy slightly gravelly clay. Gravel includes ash and brick fragments).	MC PI (IS for LL)
WS A1SC006	2.20 B12	MADE GROUND(Brown very clayey sandy gravel).	PSD SED
WS A1SC006	3.20 J15	MADE GROUND(Brown very clayey sandy gravel).	MC US for PI
WS A1SC006	5.20 B27	MADE GROUND (Brown sandy gravelly clay of intermediate plasticity).	MC PI

Contract Title :-

A66 North Trans Pennine Scheme C Section 11

Client :-

AMEY OW Limited



Signed :-

Date of issue

16/04/2021

SD/4322B/1

Page 1 of 1

EG Contract No. :-

4322B



Moisture Content/Plasticity Index and Moisture Content



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MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Specific Depth (m)	Moisture Content (%)	Date Tested	Remarks
WS A1SC006	3.20	J15	3.20	9.2	24/03/2021	

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 11	Client :- AMEY OW Limited
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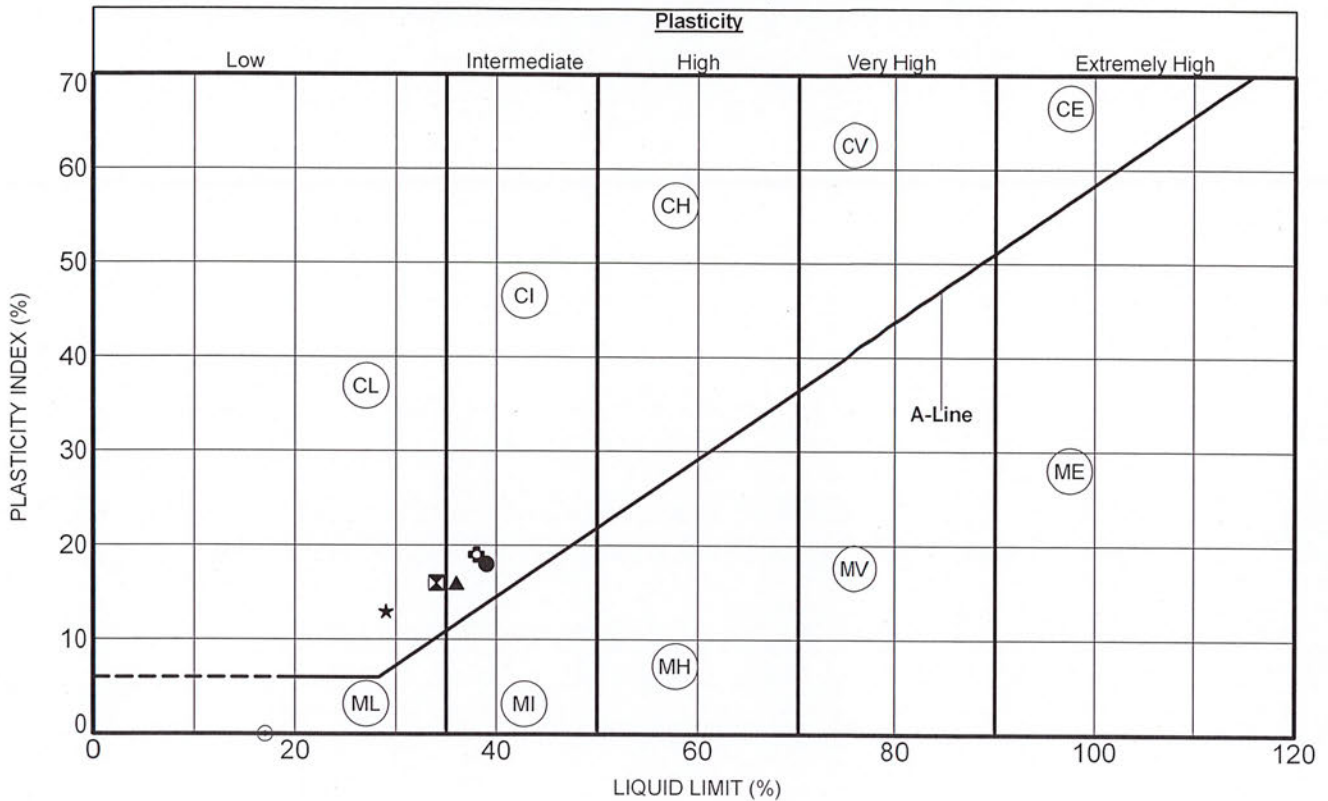
	Signed : [Redacted Signature]	Page 1 of 1 
	Date of issue :- 16/04/2021	

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ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1 to 4.4 & 5 : 1990



Exploratory Hole No.	Depth (m)	Sample Type/Ref.	Specific Depth (m)	LL	PL	PI	I_L	Preparation Method	<0.425mm (%)	m/c (%)	Date Tested
●HDP A1SC002	0.10	J1	0.10	39	21	18	-0.11	Natural		19	24/03/2021
⊠HDP A1SC002	0.30	J3	0.30	34	18	16	-0.13	Natural		16	24/03/2021
▲WS A1SC005	1.20	J5	1.20	36	20	16	-0.06	Natural		19	24/03/2021
★WS A1SC006	0.40	J2	0.40	29	16	13	-0.71	Natural		6.8	24/03/2021
⊙WS A1SC006	2.20	J10	2.20		17			Natural		18	24/03/2021
⊕WS A1SC006	5.20	B27	5.20	38	19	19	-0.11	Natural		17	24/03/2021

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI
If sample is prepared in the natural state we are unable to determine % retained on the 0.425mm test sieve.

Contract Title :-

A66 North Trans Pennine Scheme C Section 11

Client :-

AMEY OW Limited



Signed

Date of Issue :-

16/04/2021

Certificate No. :-

PI/4322B/1

AEG Contract No. :-

4322B

Page 1 of 1



Determination of Particle Density

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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DETERMINATION OF PARTICLE DENSITY

BS1377 : Part 2 : Clause 8.2 : 1990

Exploratory Hole No.	Depth (m)	Sample Type & No.	Specific Depth (m)	Particle Density (Mg/m ³)	Date Tested
HDP A1SC002	0.80	B4	0.80	2.61	26/03/2021

For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- A66 North Trans Pennine Scheme C Section 11	Client :- AMEY OW Limited
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	Signed		Page 1 of 1	
	Date of		EG Contract No. :- 4322B	

18/04/2021

PD/4322B/1

1367

Particle Size Distribution Sieving and Sedimentation

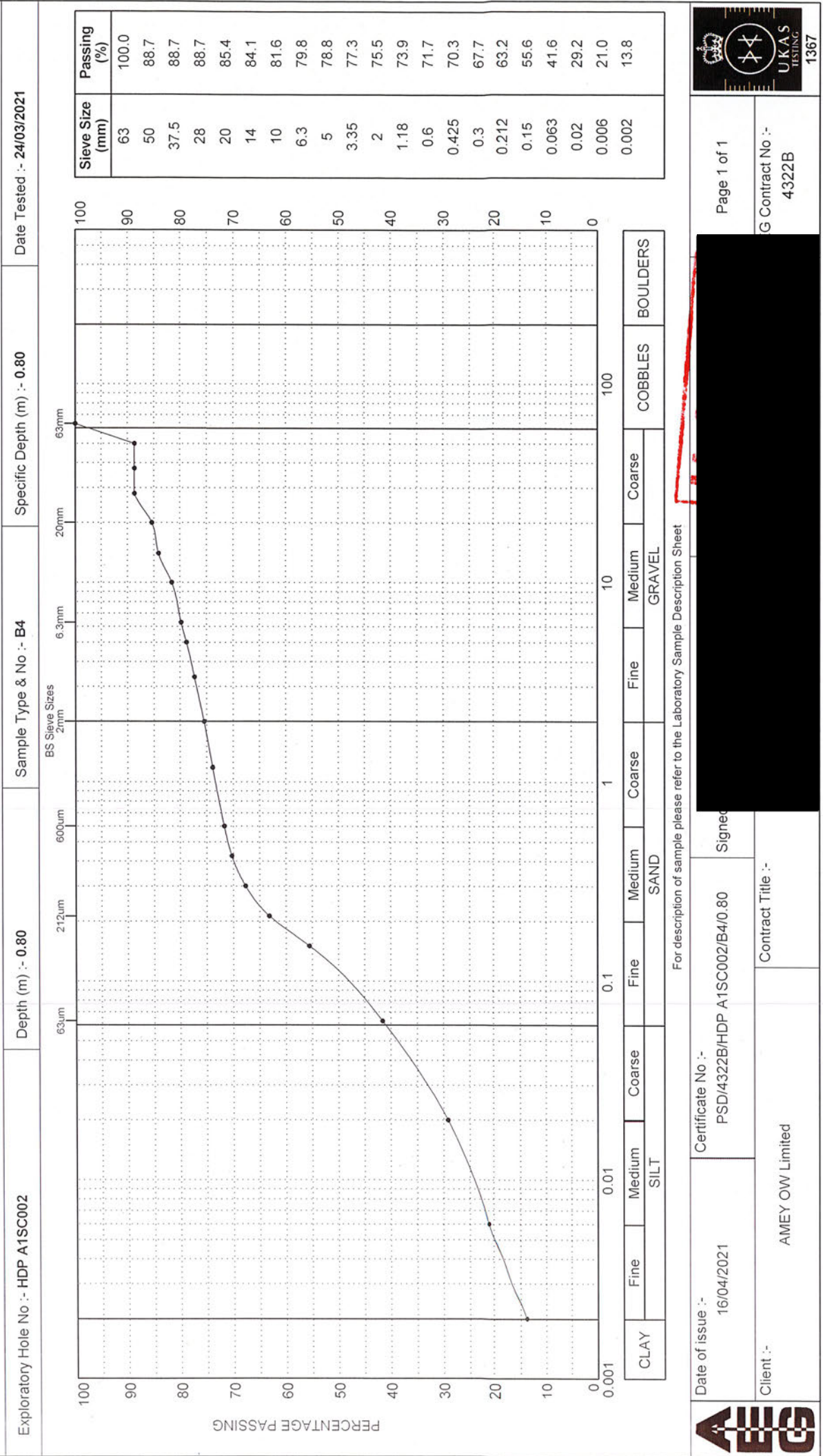


ALLIED EXPLORATION & GEOTECHNICS LIMITED

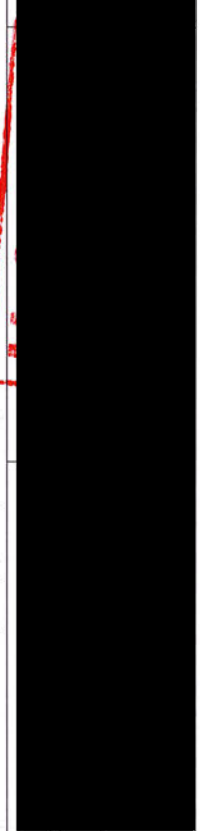
Head Office: Unit 25, Skelton, Gill Industrial Estate, Paddock Fall, Chester-le-Street, Co. Durham, DH2 2RG. Tel: 0191 387 4700 Fax: 0191 367 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL. Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



Page 1 of 1
G Contract No :- 4322B



Date of issue :- 16/04/2021	Certificate No :- PSD/4322B/HDP A1SC002/B4/0.80	Signed	
Client :- AMEY OW Limited		Contract Title :-	

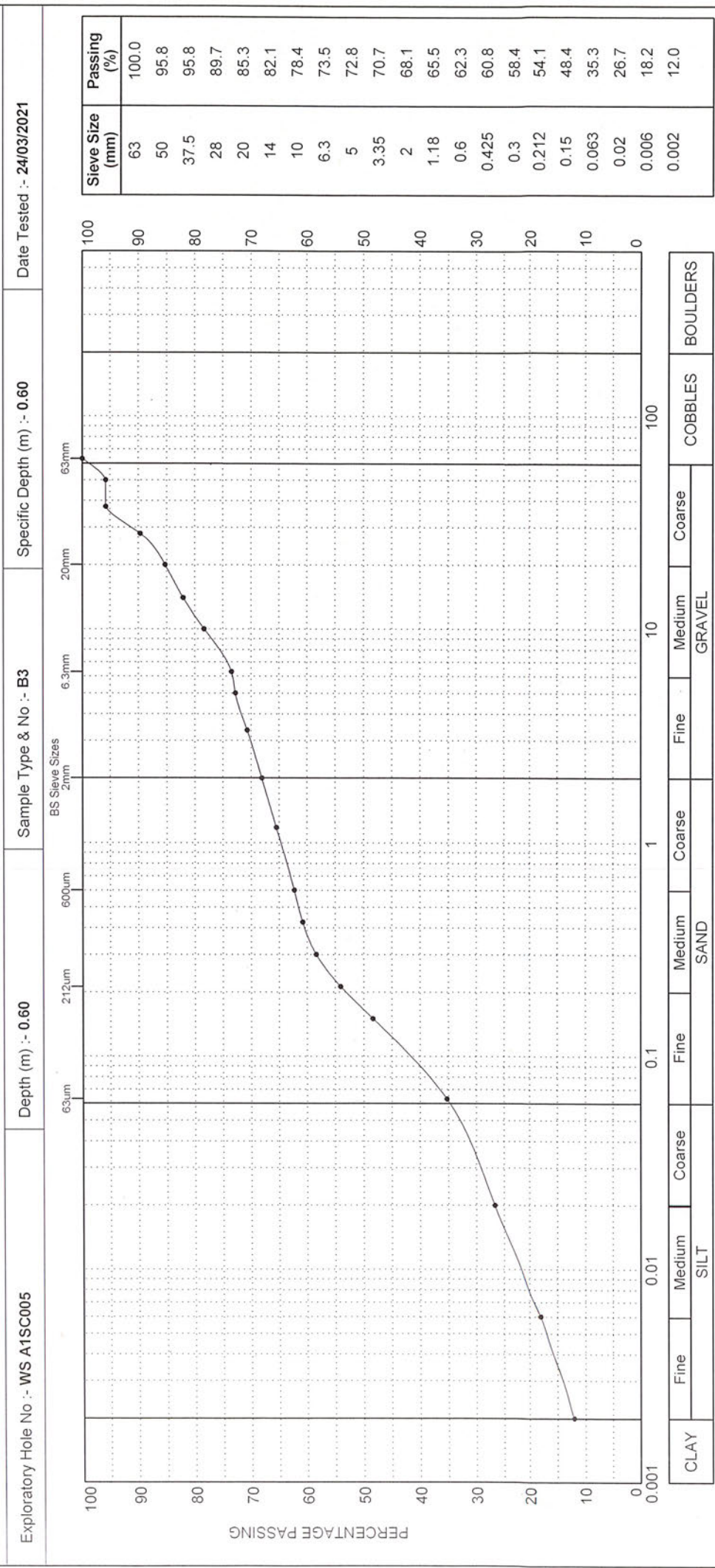


ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 16/04/2021	Certificate No :- PSD/4322B/WS A1SC005/B3/0.60	Page 1 of 1	Contract No :- 4322B
Client :- AMEY OW Limited		Contract Title :- Abb North Trans Pennine Scheme C-Section 11	

1367

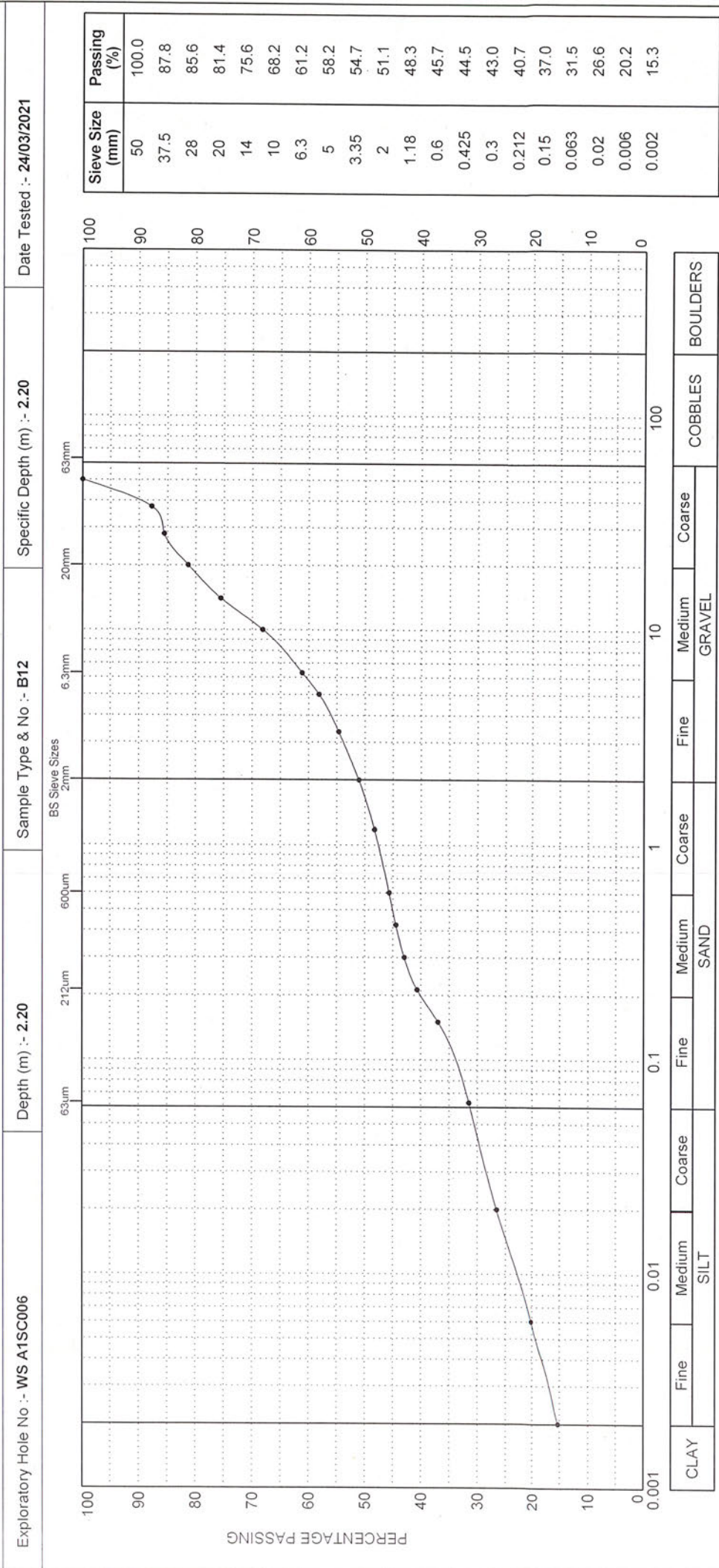


ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Shella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2EG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Earnam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 599

PARTICLE SIZE DISTRIBUTION

BS1377 : Part 2 : Clause 9.2 & 9.4 : 1990



For description of sample please refer to the Laboratory Sample Description Sheet

Date of issue :- 16/04/2021	Certificate No. :- PSD/4322BWS A1SC006/B12/2.20	Signed :-	Page 1 of 1
Client :- AMEY OW Limited	Contract Title :-	AEG Contract No. :- 4322B	
A66 North Trans Pennine Scheme C Section 11		UKAS TESTING 1367	

Determination of California Bearing Ratio



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit 20, Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL - Tel: 01772 735 300 Fax: 01772 735 999

DETERMINATION OF THE CALIFORNIA BEARING RATIO

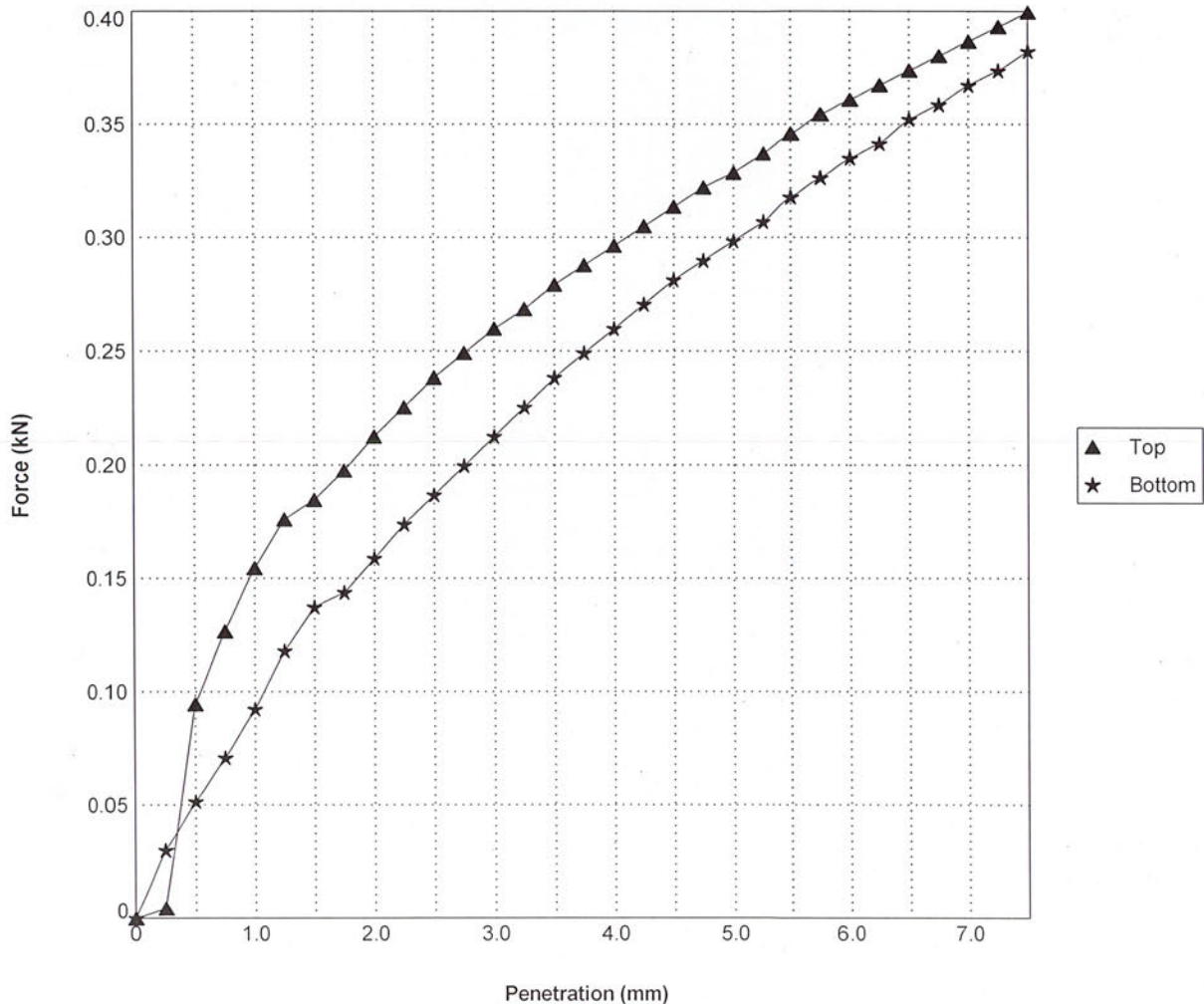
BS 1377 : Part 4 : 1990 and Part 2 : Clause 3.2 : 1990

Exploratory Hole No.- HDP A1SC002

Sample No.- B4

Depth (m)- 0.80

"As Received" Moisture Content (%) :	Surcharge (Kg) :	6
Retained on 20mm (%) :	Seating Load (N) :	Top 10 / Bottom 10
Correction Needed :	Test Moisture Content (%) :	Top 24 / Bottom 24
Soaking Time (Days) :	Bulk Density (Mg/m ³) :	1.96
Swelling (mm) :	Dry Density (Mg/m ³) :	1.58
Date Tested :	25/03/2021	CBR Value (%) :
Preparation Method :	4.5kg Compaction	Top 1.8 / Bottom 1.5
Remarks :		



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-

A66 North Trans Pennine Scheme C Section 11

Client :-

AMEY OW Limited



Signed :-

Date of issue :-

23/04/2021

Certificate No :-

CBR/4322B/HDP A1SC002/B4/0.80/1

AEG Contract No. :-

4322B

Page 1 of 1



**Specialist Chemical Testing
(Tested Externally)**



DETS

Certificate of Analysis

Certificate Number 21-05761

Issued: 01-Apr-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05761

Client Reference 4322B

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 11

Description 6 Soil samples, 4 Leachate samples.

Date Received 18-Mar-21

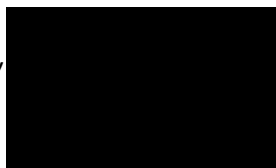
Date Started 18-Mar-21

Date Completed 01-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
HDP A1SC001A	3	0.3	1818972	25/03/2021	Brown sandy CLAY
HDP A1SC001A	5	1	1818973	25/03/2021	Brown sandy CLAY
HDP A1SC002	2	0.2	1818974	25/03/2021	Dark brown gravelly, sandy CLAY
HDP A1SC002	5	1	1818975	25/03/2021	Dark brown sandy CLAY
HDP A1SC003	2	0.2	1818976	25/03/2021	Dark brown sandy CLAY including some rootlets
HDP A1SC003	5	1	1818977	25/03/2021	Dark brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818972	1818973	1818974
Sample ID	HDP A1SC001A	HDP A1SC001A	HDP A1SC002
Depth	0.30	1.00	0.20
Other ID	3	5	2
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	5.4	5.9	4.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.3	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	11	11	10
Chromium III	DETSC 2301*	0.15	mg/kg	11	11	10
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	41	32	47
Lead	DETSC 2301#	0.3	mg/kg	28	26	30
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	8.1	14	17
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	51	67	81
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	3.4	2.5	3.8
pH	DETSC 2008#		pH	7.7	7.9	7.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.0	0.5	1.5
Organic matter	DETSC 2002#	0.1	%	1.7	0.9	2.6
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	16
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	323	208	299

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818972	1818973	1818974
Sample ID	HDP A1SC001A	HDP A1SC001A	HDP A1SC002
Depth	0.30	1.00	0.20
Other ID	3	5	2
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818972	1818973	1818974
Sample ID	HDP A1SC001A	HDP A1SC001A	HDP A1SC002
Depth	0.30	1.00	0.20
Other ID	3	5	2
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818975	1818976	1818977
Sample ID	HDP A1SC002	HDP A1SC003	HDP A1SC003
Depth	1.00	0.20	1.00
Other ID	5	2	5
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	5.1	5.7	4.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2	0.7	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.5	0.9
Chromium	DETSC 2301#	0.15	mg/kg	14	12	11
Chromium III	DETSC 2301*	0.15	mg/kg	14	12	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	39	39	31
Lead	DETSC 2301#	0.3	mg/kg	31	44	50
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	24	11	22
Selenium	DETSC 2301#	0.5	mg/kg	1.1	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	84	87	110
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	3.9	6.0	3.9
pH	DETSC 2008#		pH	7.9	8.2	8.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.0	2.1	2.2
Organic matter	DETSC 2002#	0.1	%	1.8	3.6	3.8
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	181	388	194

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818975	1818976	1818977
Sample ID	HDP A1SC002	HDP A1SC003	HDP A1SC003
Depth	1.00	0.20	1.00
Other ID	5	2	5
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818975	1818976	1818977
Sample ID	HDP A1SC002	HDP A1SC003	HDP A1SC003
Depth	1.00	0.20	1.00
Other ID	5	2	5
Sample Type	ES	ES	ES
Sampling Date	12/03/2021	12/03/2021	12/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.04	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	0.06	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.19	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Sample Id HDP A1SC001A 5 1.00

Sample Numbers 1818973 1818978 1818979

Date Analysed 25/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	0.8
DETSC 2003# Loss On Ignition	%	2.5
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10
DETSC 3301 PAHs	mg/kg	< 1.6
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	< 0.16	0.3	< 0.002	< 0.01
DETSC 2306 Barium as Ba	1.6	2.7	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.39	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	0.58	1.1	< 0.004	< 0.02
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	< 0.090	0.24	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	5.4	5	0.011	0.051
DETSC 2055 Chloride as Cl	1800	920	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	1500	1100	< 20	< 100
DETSC 2009* Total Dissolved Solids	17000	23000	34	220.2
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	5.9	5.7
DETSC 2009 Conductivity uS/cm	23.8	32.2
* Temperature*	18.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.123

Stage 1

Volume of Leachant L2*	0.229
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.983
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Sample Id HDP A1SC002 2 0.20

Sample Numbers 1818974 1818980 1818981

Date Analysed 25/03/2021

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units		Result		Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%		1.6		3	5	6
DETSC 2003# Loss On Ignition	%		3.8		n/a	n/a	10
DETSC 3321# BTEX	mg/kg		< 0.04		6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg		< 0.01		1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg		< 10		500	n/a	n/a
DETSC 3301 PAHs	mg/kg		< 1.6		100	n/a	n/a
DETSC2008# pH	pH Units				n/a	>6	n/a
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg				n/a	TBE	TBE
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg				n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	< 0.16	0.26	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	1.4	3	< 0.02	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.030	< 0.030	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.45	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	0.6	1.1	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.010	< 0.010	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	< 0.50	< 0.50	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.097	0.4	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	3.8	4.3	0.008	0.042	4	50	200
DETSC 2055 Chloride as Cl	1300	1000	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1	10	150	500
DETSC 2055 Sulphate as SO4	1400	1200	< 20	< 100	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	12000	19000	24	178.5	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	5.8	5.7
DETSC 2009 Conductivity uS/cm	17.5	26.9
* Temperature*	17.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.121
Stage 1	
Volume of Leachant L2*	0.224
Volume of Eluate VE1*	0.2
Stage 2	
Volume of Leachant L8*	0.972
Volume of Eluate VE2*	0.93

TBE - To Be Evaluated		
SNRHW - Stable Non-Reactive		
Hazardous Waste		

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05761

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1818972	HDP A1SC001A 3 0.30	SOIL	NAD	none	Michael Kay
1818973	HDP A1SC001A 5 1.00	SOIL	NAD	none	Michael Kay
1818974	HDP A1SC002 2 0.20	SOIL	NAD	none	Michael Kay
1818975	HDP A1SC002 5 1.00	SOIL	NAD	none	Michael Kay
1818976	HDP A1SC003 2 0.20	SOIL	NAD	none	Michael Kay
1818977	HDP A1SC003 5 1.00	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05761
 Client Ref 4322B
 Contract A66 North Trans Pennine Scheme C Section 11

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1818972	HDP A1SC001A 0.30 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818973	HDP A1SC001A 1.00 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818974	HDP A1SC002 0.20 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818975	HDP A1SC002 1.00 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818976	HDP A1SC003 0.20 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818977	HDP A1SC003 1.00 SOIL	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818978	HDP A1SC001A 1.00 LEACHATE	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818979	HDP A1SC001A 1.00 LEACHATE	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818980	HDP A1SC002 0.20 LEACHATE	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818981	HDP A1SC002 0.20 LEACHATE	12/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



DETS

Certificate of Analysis

Certificate Number 21-05762

Issued: 01-Apr-21

Client Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference 21-05762

Client Reference 4322B

Order No (not supplied)

Contract Title A66 North Trans Pennine Scheme C Section 11

Description 5 Soil samples, 2 Leachate samples.

Date Received 18-Mar-21

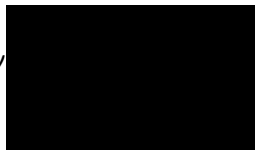
Date Started 18-Mar-21

Date Completed 01-Apr-21

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Sample ID	Other ID	Depth	Lab No	Completed	Matrix Description
WS A1SC005	1	0.2	1818982	25/03/2021	Dark brown gravelly, sandy CLAY
WS A1SC005	4	1	1818983	25/03/2021	Dark brown gravelly, sandy CLAY
WS A1SC006	1	0.2	1818984	25/03/2021	Dark brown gravelly, sandy CLAY
WS A1SC006	4	1	1818985	25/03/2021	Dark brown gravelly, sandy CLAY
WS A1SC006	9	1.90-2.20	1818986	25/03/2021	Dark brown sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818982	1818983	1818984
Sample ID	WS A1SC005	WS A1SC005	WS A1SC006
Depth	0.20	1.00	0.20
Other ID	1	4	1
Sample Type	ES	ES	ES
Sampling Date	16/03/2021	16/03/2021	16/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	3.8	3.4	2.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.0	0.6	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.4	0.5
Chromium	DETSC 2301#	0.15	mg/kg	8.5	10	5.9
Chromium III	DETSC 2301*	0.15	mg/kg	8.5	10	5.9
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	57	32	71
Lead	DETSC 2301#	0.3	mg/kg	32	26	22
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	12	9.4	8.6
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	65	55	61
Inorganics						
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	3.6	4.8	2.3
pH	DETSC 2008#		pH	8.8	7.7	7.9
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	0.2	1.6	1.5
Organic matter	DETSC 2002#	0.1	%	0.3	2.8	2.5
Sulphide	DETSC 2024*	10	mg/kg	76	40	120
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	719	418	575

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818982	1818983	1818984
Sample ID	WS A1SC005	WS A1SC005	WS A1SC006
Depth	0.20	1.00	0.20
Other ID	1	4	1
Sample Type	ES	ES	ES
Sampling Date	16/03/2021	16/03/2021	16/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	0.6	< 0.5	1.9
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	12	< 0.6	31
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	24	< 1.4	54
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	32	< 10	79
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	32	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818982	1818983	1818984
Sample ID	WS A1SC005	WS A1SC005	WS A1SC006
Depth	0.20	1.00	0.20
Other ID	1	4	1
Sample Type	ES	ES	ES
Sampling Date	16/03/2021	16/03/2021	16/03/2021
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	0.16		
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.47		
Fluorene	DETSC 3303	0.03	mg/kg	0.61		
Phenanthrene	DETSC 3303#	0.03	mg/kg	3.6		
Anthracene	DETSC 3303	0.03	mg/kg	1.0		
Fluoranthene	DETSC 3303#	0.03	mg/kg	5.0		
Pyrene	DETSC 3303#	0.03	mg/kg	3.9		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	1.8		
Chrysene	DETSC 3303	0.03	mg/kg	1.7		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	1.8		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.65		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	1.5		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.55		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.19		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.62		
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg		< 0.1	0.5
Acenaphthene	DETSC 3301	0.1	mg/kg		< 0.1	1.4
Fluorene	DETSC 3301	0.1	mg/kg		< 0.1	2.5
Phenanthrene	DETSC 3301	0.1	mg/kg		0.5	14
Anthracene	DETSC 3301	0.1	mg/kg		0.3	4.6
Fluoranthene	DETSC 3301	0.1	mg/kg		1.3	19
Pyrene	DETSC 3301	0.1	mg/kg		1.0	15
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		0.5	7.9
Chrysene	DETSC 3301	0.1	mg/kg		0.8	7.4
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		0.5	5.0
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		0.3	3.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		0.6	6.6
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		0.3	4.2
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		< 0.1	0.6
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		0.4	3.1
Coronene	DETSC 3301*	0.1	mg/kg		< 0.1	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	23		
PAH Total	DETSC 3301	1.6	mg/kg		6.9	95
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	0.7

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818985	1818986
Sample ID	WS A1SC006	WS A1SC006
Depth	1.00	1.90-2.20
Other ID	4	9
Sample Type	ES	ES
Sampling Date	16/03/2021	16/03/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	4.6	5.9
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.3
Chromium	DETSC 2301#	0.15	mg/kg	9.0	20
Chromium III	DETSC 2301*	0.15	mg/kg	9.0	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	71	73
Lead	DETSC 2301#	0.3	mg/kg	42	27
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	13	21
Selenium	DETSC 2301#	0.5	mg/kg	0.6	< 0.5
Zinc	DETSC 2301#	1	mg/kg	71	80
Inorganics					
Loss on Ignition at 440oC	DETSC 2003#	0.01	%	4.7	3.9
pH	DETSC 2008#		pH	7.9	7.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1
Total Organic Carbon	DETSC 2002	0.1	%	1.5	0.6
Organic matter	DETSC 2002#	0.1	%	2.7	1.0
Sulphide	DETSC 2024*	10	mg/kg	240	16
Sulphate as SO ₄ , Total	DETSC 2321#	100	mg/kg	567	296

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818985	1818986
Sample ID	WS A1SC006	WS A1SC006
Depth	1.00	1.90-2.20
Other ID	4	9
Sample Type	ES	ES
Sampling Date	16/03/2021	16/03/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Petroleum Hydrocarbons					
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C35-C44	DETSC 3072*	3.4	mg/kg	< 3.4	< 3.4
Aliphatic C10-C44	DETSC 3072*	10	mg/kg	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	5.1	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	39	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	100	< 1.4
Aromatic C35-C44	DETSC 3072*	1.4	mg/kg	< 1.4	< 1.4
Aromatic C10-C44	DETSC 3072*	10	mg/kg	130	< 10
Ali/Aro C10-C44	DETSC 3072*	10	mg/kg	130	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	1818985	1818986
Sample ID	WS A1SC006	WS A1SC006
Depth	1.00	1.90-2.20
Other ID	4	9
Sample Type	ES	ES
Sampling Date	16/03/2021	16/03/2021
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3303#	0.03	mg/kg		
Acenaphthylene	DETSC 3303#	0.03	mg/kg		
Acenaphthene	DETSC 3303#	0.03	mg/kg		
Fluorene	DETSC 3303	0.03	mg/kg		
Phenanthrene	DETSC 3303#	0.03	mg/kg		
Anthracene	DETSC 3303	0.03	mg/kg		
Fluoranthene	DETSC 3303#	0.03	mg/kg		
Pyrene	DETSC 3303#	0.03	mg/kg		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		
Chrysene	DETSC 3303	0.03	mg/kg		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	1.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	3.5	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	4.2	0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	27	0.2
Anthracene	DETSC 3301	0.1	mg/kg	9.5	0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	39	0.7
Pyrene	DETSC 3301	0.1	mg/kg	32	0.3
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	17	0.2
Chrysene	DETSC 3301	0.1	mg/kg	16	0.2
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	10	0.3
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	6.4	0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	13	0.2
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	8.0	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	1.3	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	6.5	0.2
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		
PAH Total	DETSC 3301	1.6	mg/kg	190	2.8
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Sample Id WS A1SC006 4 1.00

Sample Numbers 1818985 1818987 1818988

Date Analysed 25/03/2021

Test Results On Waste		
Determinand and Method Reference	Units	Result
DETSC 2084# Total Organic Carbon	%	2.9
DETSC 2003# Loss On Ignition	%	4.7
DETSC 3321# BTEX	mg/kg	< 0.04
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01
DETSC 3311# TPH (C10 - C40)	mg/kg	2000.0
DETSC 3301 PAHs	mg/kg	190.0
DETSC2008# pH	pH Units	
DETS073* Acid Neutralisation Capacity (pH4)	mol/kg	
DETS073* Acid Neutralisation Capacity (pH7)	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg	
	2:1	8:1	LS2	LS10
DETSC 2306 Arsenic as As	0.48	0.3	< 0.002	< 0.01
DETSC 2306 Barium as Ba	5.8	5.5	< 0.02	< 0.1
DETSC 2306 Cadmium as Cd	0.3	< 0.030	< 0.004	< 0.02
DETSC 2306 Chromium as Cr	0.65	< 0.25	< 0.02	< 0.1
DETSC 2306 Copper as Cu	2.7	2.6	0.005	0.026
DETSC 2306 Mercury as Hg	0.06	< 0.010	< 0.0004	< 0.002
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1
DETSC 2306 Nickel as Ni	2	< 0.50	< 0.02	< 0.1
DETSC 2306 Lead as Pb	0.95	0.65	< 0.01	< 0.05
DETSC 2306 Antimony as Sb	< 0.17	< 0.17	< 0.01	< 0.05
DETSC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03
DETSC 2306 Zinc as Zn	63	4.6	0.126	0.14
DETSC 2055 Chloride as Cl	1300	850	< 20	< 100
DETSC 2055* Fluoride as F	< 100	< 100	< 0.02	< 0.1
DETSC 2055 Sulphate as SO4	2000	1400	< 20	< 100
DETSC 2009* Total Dissolved Solids	32000	28000	64	286.4
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1
DETSC 2085 Dissolved Organic Carbon	< 2000	< 2000	< 10	< 50

WAC Limit Values		
Limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

Additional Information

DETSC 2008 pH	5.8	5.9
DETSC 2009 Conductivity uS/cm	45.6	39.6
* Temperature*	18.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.125

Stage 1

Volume of Leachant L2*	0.234
Volume of Eluate VE1*	0.2

Stage 2

Volume of Leachant L8*	0.996
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

Summary of Asbestos Analysis

Soil Samples

Our Ref 21-05762

Client Ref 4322B

Contract Title A66 North Trans Pennine Scheme C Section 11

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1818982	WS A1SC005 1 0.20	SOIL	NAD	none	Keith Wilson
1818983	WS A1SC005 4 1.00	SOIL	NAD	none	Keith Wilson
1818984	WS A1SC006 1 0.20	SOIL	NAD	none	Keith Wilson
1818985	WS A1SC006 4 1.00	SOIL	NAD	none	Keith Wilson
1818986	WS A1SC006 9 1.90-2.20	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 21-05762
 Client Ref 4322B
 Contract A66 North Trans Pennine Scheme C Section 11

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1818982	WS A1SC005 0.20 SOIL	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818983	WS A1SC005 1.00 SOIL	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818984	WS A1SC006 0.20 SOIL	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818985	WS A1SC006 1.00 SOIL	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818986	WS A1SC006 1.90-2.20 SOIL	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818987	WS A1SC006 1.00 LEACHATE	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1818988	WS A1SC006 1.00 LEACHATE	16/03/21	GJ 250ml x2, GJ 60ml x2, PT 1L x2		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

Quality Control

Quality Systems

Derwentside Environmental Testing Services (DETS) employs numerous measures to ensure high levels of confidence in the results produced. Our laboratory has been accredited by the United Kingdom Accreditation Service (UKAS) since its inception and operates in full compliance with the internationally recognised standard ISO 17025:2017 and the Environment Agency's MCERTS (Monitoring & Certification Scheme) standard for soils and waters, which provides greater assurance to all parties of the reliability of data from chemical analysis.

To obtain a copy of our full UKAS schedule visit the UKAS website at [REDACTED] and search for our laboratory number 2139, or scan the QR code.



Proficiency Testing Schemes

DETS participates in six external proficiency testing schemes in order to monitor and ensure the continuing quality of analysis. These schemes cover soil, water and fuel analysis and the schemes are:



Contest

Aquacheck



Internal Quality Control

DETS runs a strict internal quality control system. A minimum of 5% of all samples that undergo analysis in our laboratories are quality control samples. This way we can ensure a high level of confidence in all of the analytical data produced. In addition, MCERTS accredited tests must meet strict, ongoing limits for precision and bias, to maintain their accreditation status.

The types of internal Analytical Quality Control (AQC) samples undertaken by DETS include Blanks, Internal QC, Calibration Checks, Surrogates and Internal Standards.

In addition to internal AQC, DETS also checks aspects of instrument performance. These checks are in general method specific. Examples are, but not limited to, retention time, peak area, signal to noise, SPE column, peak shape and peak tailing check standards.

Quality Control

Methods

DETS currently have over 140 documented methods for analytical analysis. The analytical methods are always available to employees for reference purposes. All the methods follow a documented procedure for content and headings, including health and safety, interferences, reagents and standards preparation, quality control, method procedure, analysis of results, acceptability criteria and disposal of waste.

Procedures

DETS currently have over 170 documented Standard Operating Procedures (SOPs), covering every section of the business.

The Key Quality procedures include:

- DETSC.SOP 1002 - Contract Review
- DETSC.SOP 1003 - Deviating Samples
- DETSC.SOP 1010 - Checking a Report
- DETSC.SOP 1206 - Supplier/Subcontractor Approval and Review
- DETSC.SOP 1401 - FERA Plant Health License
- DETSC.SOP 3001 - Analysis of AQC Samples
- DETSC.SOP 3004 - QC Chart Review
- DETSC.SOP 3005 - AQC Failure Reporting
- DETSC.SOP 3010 - Control of Nonconforming Testing
- DETSC.SOP 3102 - Complaint Handling
- DETSC.SOP 3103 - Corrective & Preventive Action
- DETSC.SOP 3201 - Uncertainty of Measurement
- DETSC.SOP 3204 - Validation, Evaluation and Revalidation of Methods
- DETSC.SOP 3401 - Documentation of Methods
- DETSC.SOP 3402 - Document Control - Issuing and Removal of Controlled Documents
- DETSC.SOP 3404 - Internal Audit Procedure
- DETSC.SOP 3407 - Training
- DETSC.SOP 3408 - Control of Records & Data
- DETSC.SOP 3411 - Archiving of Documents and Records
- DETSC.SOP 3412 - Competency
- DETSC.SOP 3501 - Handling PT Schemes
- DETSC.SOP 4203 - Handling Scheduled Samples
- DETSC.SOP 4204 - Handling Unscheduled Samples
- DETSC.SOP 4205 - Sending Subcontracted Samples

DETS also have documented procedures for equipment calibration and scheduled checks, including procedures for balances, hotblock digesters, furnaces, shakers, ovens, fridges, incubators, sonic baths, thermometers, timers, auto-dispensers and syringes.

Quality Control

Training

All new employees at DETS undergo a formal induction on the first day, covering an introduction to the Company, followed by an overview of the Quality Systems, the Environmental Systems and the Health and Safety Systems, Human Resources Systems, Information Technology Systems and finally an overview of the Laboratory Operations.

All new employees at DETS also undertake a Week 1 Induction schedule covering AQC Analysis and Failure Reporting and Basic Laboratory Skills.

All training on analytical methods follows a documented process requiring the employee to read and observe the method being conducted. The employee must then conduct the method under supervision on at least three occasions to the required standard before both the trainer, trainee and section manager sign the training record. Before the trainee can perform the method unsupervised, a method training verification (MTV) audit must be undertaken by a senior member of staff to verify the trainee is undertaking analysis to the required standard.

Competency

All employees will have their competency to undertake analytical methods assessed every year. Competency is usually assessed by PT Scheme Testing Results, Method Audits, MTV Audits or UKAS Audits.

If no record of competency is present within a 12-month period, the employee will have to undergo a MTV audit before undertaking any further analytical method analysis.

DETS INFO 008 – Sample Holding Time Information

Soil

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				pre drying/extraction ¹	post drying/extraction ²
Acid Herbicides	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
Aliphatic/Aromatic	Glass	20g	EPA Victoria	14 days	-
Ammonium	Glass or plastic	20g	E DIN 19746	3 days	30 days
Anions	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Boron	Glass or plastic	50g	BS ISO18512:2007	6 months	30 years
BTEX	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Carbonate	Glass or plastic	20g	Lab Validation	4 weeks	1 year
Chloride	Glass or plastic	20g	BS ISO18512:2007	1 month	3 years
Conductivity	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Cyanide	Glass or plastic	20g	EPA SW-846 Chapter 3	14 days	-
Heavy metals	Glass or plastic	10g	BS ISO18512:2007	6 months	30 years
Hexavalent chromium	Glass or plastic	20g	BS ISO18512:2007	30 days	-
Loss on ignition	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
Mercury	Glass or plastic	10g	EPA SW-846 Chapter 3	28 days	-
OCP	Glass	20g	BS ISO18512:2007	1 month	-
Oil & grease	Glass	20g	EPA SW-846 Chapter 3	28 days	-
Organic matter/TOC	Glass or plastic	20g	EPA SW-846 Chapter 3	28 days	-
PAH	Glass	20g	EPA Victoria	14 days	-
PCB	Glass	20g	BS ISO18512:2007	1 month	-
pH	Glass or plastic	20g	BS ISO18512:2007	1 week	3 years
Phenols	Glass	20g	EPA Victoria	14 days	-
PRO	60ml glass jar	Full container	EPA SW-846 Chapter 4	14 days	-
Sulphate	Glass or plastic	50g	BS ISO18512:2007	1 month	3 years
Sulphide	Glass or plastic	20g	EPA SW-846 Chapter 3	7 days	-
SVOC	Glass	20g	EPA SW-846 Chapter 4	14 days	40 days
TEM/CEM	Glass	20g	EPA Victoria	14 days	-
Total sulphur	Glass or plastic	20g	EPA Victoria	7 days	-
TPH (C10-C40)	Glass	20g	EPA Victoria	14 days	-
VOC	60ml glass jar	Full container	EPA SW-846 Chapter 4	7 days	-
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

¹ From sampling to extraction

² Once extracted

DETS INFO 008 – Sample Holding Time Information

Water

Analyte	Container type	Minimum sample required	Reference	Maximum holding time from sampling	
				Preservative required	Holding Time
Acid Herbicides	Glass	500	EPA SW-846 Chapter 4	none	7 days
Alkalinity	Glass or plastic	100	ISO 5667 3:2018	none	2 weeks
Aluminium (Reactive)	Glass or plastic	50	DETS Stability Study	none	2 days
Ammonium	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	3 weeks
BOD	Glass or plastic	500	DETS Stability Study	none	2 days
Boron	Plastic	20	ISO 5667 3:2018	HNO ₃	6 months
Bromide	Glass or plastic	20	ISO 5667 3:2018	none	1 month
BTEX	Glass vial	Full container	EPA SW-846 Chapter 4	none	7 days
Chloride / Fluoride	Glass or plastic	20	ISO 5667 3:2018	none	1 month
COD	Glass or plastic	20	ISO 5667 3:2018	Sulphuric acid	6 months
Conductivity	Glass or plastic	100	ISO 5667 3:2018	none	1 day
Cyanide	Glass or Plastic	50	EPA SW-846 Chapter 3	NaOH	14 days
Hexavalent chromium	Glass or plastic	20	ISO 5667 3:2018	none	4 days
Metals (including Hardness)	Glass or plastic	20	EPA SW-846 Chapter 3	HNO ₃	6 months
Mercury	Glass or plastic	20	ISO 5667 3:2018	HNO ₃	6 months
Nitrate	Glass or plastic	20	EPA SW-846 Chapter 3	none	28 days
Nitrite	Glass or plastic	20	DETS Stability Study	none	5 days
OCP	Glass	500	ISO 5667 3:2018	Dark Glass	7 days
Oil & grease	Glass	500 (Separate bottle)	ISO 5667 3:2018	HCl / HNO ₃ / H ₂ SO ₄	1 month
PAH	Glass	500	ISO 5667 3:2018	none	4 days
pH	Glass or plastic	50	ISO 5667 3:2018	none	1 day
PCB	Glass	500	EPA Victoria	none	7 days
Phenols	Glass	500	ISO 5667 3:2018	H ₃ PO ₄ / H ₂ SO ₄	21 days
Phosphate	Glass or plastic	20	DETS Stability Study	none	5 days
Phosphorus	Glass or plastic	20	EPA Victoria	HNO ₃	28 days
PRO	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO ₃ / H ₂ SO ₄	7 days
Sulphate	Glass or plastic	20	ISO 5667 3:2018	none	1 month
Sulphide	Plastic	50	ISO 5667 3:2018	Zinc acetate / Na ₂ CO ₃	7 days
Suspended solids	Glass or plastic	100	ISO 5667 3:2018	none	2 days
SVOC	Glass	500	EPA SW-846 Chapter 4	none	7 days
TDS / Total Solids	Glass or plastic	500	ISO 5667 3:2018	none	7 days
Thiocyanate	Glass or plastic	50	DETS Stability Study	none	3 days
TOC/DOC	Glass or plastic	20	EPA SW-846 Chapter 3	H ₂ SO ₄	28 days
TON	Glass or plastic	20	DETS Stability Study	none	5 days
TPH/EPH	Glass	500 (Separate bottle)	ISO 5667 3:2018	none (HCl / HNO ₃)	4 days (1 Month)
VOC	Glass vial	Full container	ISO 5667 3:2018	HCl / HNO ₃ / H ₂ SO ₄	7 days
Whole Oil Interpretation	60ml glass jar	Full container	-	-	-

DETS INFO 008 – Sample Holding Time Information

Fuel

Due to the nature of fuel samples, no sample holding time is appropriate.

Asbestos

Due to the nature of asbestos samples, no sample holding time is appropriate.

Whole Oil Interpretation

Due to the nature of whole oil interpretation, no sample holding time is appropriate.

Unaccredited Methods

As unaccredited methods may not have undertaken a full validation programme, no sample holding time study has been undertaken. A study will be conducted (if required) during the process of accreditation of the method.

Sample Transport Environment

$5 \pm 3^{\circ}\text{C}$

Sample Storage environment

$3 \pm 2^{\circ}\text{C}$

DETS INFO 001 - Analytical Method Summary

Method Number	Title	Description	Reference	LOD	Accreditation Status
DETSC 1001	Sample Pre-Treatment and Preparation of Solids	Solid samples are classified and identified. Samples requiring analysis for unstable or volatile determinands are analysed as received. Samples requiring analysis for stable and non-volatile determinands are dried at <30°C or 50°C, depending on requirements, for a minimum of 16hrs (overnight). Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill and sieved through a 250µm sieve to ensure they are homogenous.	BS1377:1990 – Soils for Civil Engineering Purposes The preparation and pre-treatment of potentially contaminated soils prior to chemical analysis – MEWAM – 2006 – Environment Agency	n/a	Not Accredited
DETSC 1002	Description of Soil Sample Type	This method outlines the procedure used to describe soil samples with respect to basic type, predominant colour and inclusions. The procedure is carried out during the sample preparation stage.	BS 5930:Section 6:1999	n/a	Not Accredited
DETSC 1003	Stone and Glass / Metal / Plastic Content of Soil	This method outlines the procedure used to determine the Stone and Glass/Metal/Plastic content of soil samples. The procedure is carried out during the sample preparation stage.	BS 3882:2007 BS 1377:1990	0.10%	Not Accredited
DETSC 1004	Natural Moisture Content / Loss on Drying of Soil	Loss on drying is determined by loss of mass on drying in an oven set at 28°C. Moisture content is determined by loss of mass on drying in an oven set at 105°C. The procedure is carried out during the sample preparation stage.	Practical Environmental Analysis, Radojevic & Bashkin, RSC 1999 BS 1377: Part 2:1990 DETS drying time study	0.10%	Not Accredited
DETSC 1005	Soil Crushing	Dried samples are crushed in a jaw crusher, if necessary, and then ground using a mechanical mixer mill to ≤250µm to ensure they are homogenous.	In-house Method	n/a	Not Accredited
DETSC 1006	Soil Weighing	Soil samples are weighed to predefined tolerances into batches in preparation for extraction and analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1007	Batch Scanning	Batches of soil prepared as per DETSC 1006 – Soil Weighing are scanned to create LIMS worksheets for individual method extraction and analysis. Addition of extraction reagents followed by shaking or standing overnight of certain methods is also conducted.	In-house Method	n/a	Not Accredited
DETSC 1008	Handling Liquid Samples	Liquid samples are filtered and/or fixed before analysis by documented methods.	In-house Method	n/a	Not Accredited
DETSC 1009	Leachate Preparation (NRA Method and BS EN 12457 Parts 1-3)	Leachates are prepared as per the NRA (1994) method and as per BS EN 12457 Parts 1 - 3 one and two stage leachate preparation.	Leaching Test Method for the Assessment of Contaminated Land, Interim Guidance, NRA(1994) BS EN 12457 Part 1,2 & 3	n/a	Not Accredited
DETSC 1010	Leaching Characteristics of Moulded and Monolithic Building or Waste Materials	A block of the material to be analysed is placed into an appropriate container ensuring that there is a gap of at least 2cm around the test piece on all sides (including the base). The container is then filled with deionised water and covered. At set time periods, the water is drained from the container which is then re-filled. The water drained out of the container is retained and analysed for the components of interest.	EA NEN 7375:2004 – Leaching Characteristics of Moulded or Monolithic Building and Waste Materials	n/a	Not Accredited
DETSC 1101	Asbestos - Bulk Analysis	Samples are examined visually for the presence of asbestos containing materials or asbestos fibres. Suspect fibres are removed from the sample and examined using polarised light microscopy to determine whether they are asbestos fibres. If no asbestos fibres are identified by the method after an adequate length of examination time, and after at least two small pinch samples have been examined, then the sample may be reported as 'NAD' (no asbestos detected).	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures, 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Research Institute, 1987 LAB 30, Application of ISO/IEC17025 for Asbestos Sampling and Testing, UKAS, Edition 3, January 2015	n/a	UKAS

DETS 1102	Quantification of asbestos in soils, loose aggregates and ballast	The method of quantification is divided into three procedures: Gravimetric analysis, detailed gravimetric analysis and PCOM analysis. The analysis may be affected by the client's requirements as determined by contract review, and by the nature of the asbestos found in the sample, e.g. whether ACMs are present, and whether fibre bundles large enough to pick out using tweezers are found in the sample.	HSG 248 Asbestos: The Analysis Guide for Sampling, Analysis and Clearance Procedures. 2005 McCrone W.C., Asbestos Identification (Second Edition), The McCrone Research Institute, 2005 HSG264 Asbestos: The survey guide. HSE Books, 2010 Davies, L. S.T., Wetherill, G. Z., McIntosh, C., McGonagle, C., Addison, J. 1996. Development and validation of an analytical method to determine the amount of asbestos in soils and loose aggregates. HSE Contract Research Report NO. 83/1996. HSE Books	Gravimetric Analysis: 0.01% for 1kg sample Detailed Gravimetric Analysis: 0.001% for 50g sample PCOM Analysis: 0.001%	UKAS
DETS 1103	Asbestos Water Absorption Test	This test involves a sample of the asbestos product being dried and weighed before being immersed in water for a period of time. The sample is then removed from the water and re-weighed. If the amount of water absorbed is <30% by weight, then the sample should be reported as 'Not Licensed'. If ≥30% water is absorbed then the sample should be reported as being 'Licensed', i.e. an asbestos material for which a licence is required to work on.	Work with Materials Containing Asbestos: Approved Code of Practice and Guidance. HSE Books, 2006.	n/a	UKAS
DETS 1104 (DRAFT)	Respirable Fibres in Soil and Dust	The analysis can follow-on from a quantitative analysis, or be scheduled as a test on its own, according to client requirements. A known mass of between 8g and 12g is removed and mixed with 1000ml of water. The mixture is stirred for 1 hour using a magnetic stirrer. A portion of the mixture is filtered through a 10 micron pore size filter, to collect a filtrate containing a sample of the respirable dust. The mass of respirable (PM10) dust per ml of the filtrate is calculated, and this value is used to decide how much of the filtrate is to be used for the rest of the analysis. Then, a known quantity of the filtrate is filtered through a cellulose-ester filter papers with a pore size of 0.8-1.2 microns. The filter is then placed onto a microscope slide, allowed to air dry, and then cleared and fixed using the acetone/triacetin method described in HSG 248. The filter is then evaluated using PCOM. From the number of respirable fibres observed on the slide the number of respirable fibres per mg of dust is calculated.	Asbestos: The analyst's guide for sampling, analysis and clearance procedures. HSG248, HSE Books, 2005 Asbestos: The survey guide. HSG264, HSE Books, 2012.	n/a	Not Accredited
DETS 2002	Organic matter content of soil	The procedure is based upon Walkley and Black's method. Organic matter in soil is oxidised with potassium dichromate in the presence of concentrated sulphuric acid. The excess dichromate is titrated with ferrous sulphate using diphenylamine as an external indicator. The organic matter content is calculated from the amount of dichromate used during the oxidation process based on an empirical relationship.	BS1377 : Part 3 : 1990 Method 3 BS1377 : Part 1 : 1990 BS 3882:2007	0.10%	MCERTS(Soils)
DETS 2003	Loss On Ignition	Soil is ignited at 440C and the amount of sample lost on ignition is determined gravimetrically. Other specified temperatures may be used but are not accredited.	BS1377 : Part 3 : 1990 Method 4 BS1377 : Part 1 : 1990	0.01%	MCERTS(Soils)
DETS 2004	Sulphate and Total Sulphur Content of Soil, Aggregate and Water	The sulphate in the soil is dissolved in dilute hydrochloric acid, or in an aqueous extract having a water:soil ratio of 2:1 and the insoluble residue is removed by filtration. Waters are also filtered prior to analysis. The sulphate in the filtrate is precipitated as barium sulphate which is then filtered, ignited and weighed. Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3 : 1990 Method 5 BS1377 : Part 1 : 1990 BRE SD1: 2005 Concrete in Aggressive Ground	Acid Soluble: 0.01% Water Soluble: 100mg/l Waters: 10mg/l	MCERTS(Soils) Not Accredited (Aggregates)
DETS 2005	Carbonate content of soil by Rapid Titration	The carbonate present in the soil reacts with a known excess of hydrochloric acid liberating carbon dioxide. The acid remaining after the reaction is determined by titration against sodium hydroxide. The result is calculated in terms of the equivalent proportion of carbon dioxide.	BS 1377: Part 1: 1990 BS 1377: Part 3: 1990: Method 5	1%	UKAS
DETS 2006	Water Soluble Chloride Content of Soil & Chloride Content of Water	Chloride in the soil is extracted in deionised water and the insoluble material is removed by filtration. Water samples are filtered prior to analysis. The chloride in solution is analysed by titration using Mohr's method titration with standard silver nitrate solution using potassium chromate as an indicator.	BS1377 : Part 3 : 1990 Method 7.2 BS1377: Part 1: 1990	Soil: 0.01% Water: 10mg/l	UKAS
DETS 2007	Acid Soluble Chloride Content of Soil and Concrete	The chloride in the sample is dissolved in nitric acid and the insoluble material is removed by filtration. The dissolved chloride is analysed by Volhard's method. The chloride in solution is precipitated with a known excess of standard silver nitrate. The excess silver nitrate is titrated against standard ammonium thiocyanate using ferric alum as an indicator. The colour change is white to red.	BS1377 : Part 3 : 1990 Method 7.3 BS1377: Part 1: 1990 BS 1881-124:1988	0.01%	UKAS

DETSC 2008	pH Value of Soil and Water	The pH value of a soil suspension in water or a groundwater sample is determined electrometrically using a glass electrode.	BS1377: Part 3: 1990 – Soils for Civil Engineering Purposes – Chemical and Electrochemical Methods	n/a	MCERTS (Soils) UKAS (Waters)
DETSC 2009	Electrical Conductivity of Soil & Water	The electrical conductance of a soil suspension in water or of a water sample is determined by voltammetry using a conductivity meter. In some cases, the soil may need to be extracted with an aqueous solution of an inorganic salt e.g. the conductivity of topsoil is determined by preparing a suspension of the soil in saturated calcium sulphate.	Standard Methods for the Examination of water and Wastewater Part 2510B 21st Edition 2005 APHA, AWWA, WEF BS3882:2007 Specification for Topsoil	1uS/cm	UKAS
DETSC 2010	Chloramine in Water Samples	Free available residual chlorine reacts with diethyl-p-phenylenediamine (DPD) to produce a pink/red coloured complex. The addition of a small amount of potassium iodide causes mono-chloramine to produce the same pink/red colour with the same reagent. Further addition of an excess of iodide causes di-chloramine and any nitrogen tri-chloride to react and produce a colour. The pink/red coloured complex is titrated with ferrous ammonium sulphate to a clear endpoint.	In-house Method	100µg/l	Not Accredited
DETSC 2011	Acid Alkali Reserve	An initial pH value is obtained for the sample. The sample is then titrated with either hydrochloric acid or sodium hydroxide to a pH of 7.00. From this result, the acid/alkali reserve value can be calculated.	In-house Method	TBC	Not Accredited
DETSC 2012	Biofilm Potential of Sewage and Sludges	Sodium hypochlorite solution is added to the sample in small increments. The sample temperature is monitored during the additions until no further changes in temperature occur due to all of the bacteria in the sample having been effectively neutralised.	In-house Method	TBC	Not Accredited
DETSC 2013	Gravimetric Carbonate Content of Soils	A dried and finely crushed portion of the sample is ashed in a muffle furnace at 440°C for 4 hours to burn off any organic materials in the sample. The crucible containing the sample is then allowed to cool and is re-weighed and then returned to the furnace at a temperature of 950°C which will break down any carbonates present and release them as carbon dioxide gas. The carbonate content of the sample is then determined by calculation.	The British Calcium Carbonates Federation–Calcium Carbonate – Occurrence and uses	0.10%	Not Accredited
DETSC 2014	Total and Available Lime Content	Samples for Total Lime are extracted with hot hydrochloric acid and analysed for calcium by ICP-OES. Samples for available lime content are extracted with hot water using granulated sugar as a catalyst and analysed by titration with standardised hydrochloric acid.	BS 4551: Part 2: 1998– Methods of testing mortars, screed and plasters. Chemical analysis and aggregate grading	TBC	Not Accredited
DETSC 2015	Initial Consumption of Lime	The pH of a saturated calcium hydroxide solution is measured at ambient temperature. Several portions of the sample to be analysed are weighed out and differing amounts of lime are added to each one. The samples are mixed with water and then shaken. After shaking the pH of each portion is determined and a graph plotted of pH against percentage of lime. From this graph, the initial consumption of lime is determined (this is the lime percentage at which the sample pH is the same as that of the saturated calcium hydroxide solution).	BS 1924: Part 2: 1990 – Stabilized materials for civil engineering purposes. Methods of test for cement-stabilized and lime-stabilized materials	TBC	Not Accredited
DETSC 2016	Redox Potential of Soil and Water	Redox potential is measured using a probe with two electrodes, one of platinum and the other of silver chloride between which the potential of the solution being tested is measured in millivolts. The probe is placed into the sample and a direct reading in millivolts is given on the meter attached to the redox probe. Soils are analysed by preparation of a 2:1 water to soil sludge.	Encyclopaedia of Soils in the Environment 2005 – Redox Potential	n/a	Not Accredited
DETSC 2017	Salinity of Soils and Waters by Calculation	The conductivity of the sample is measured in µS/cm and from this result the salinity is calculated.	Method 2520B - Standard Methods for the Examination of Water and Wastewater - 21st Edition – 2005	n/a	Not Accredited
DETSC 2018	Specific Gravity of Sludge	The 'as received' sample is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed, and the specific gravity of the sample is calculated.	In-house Method	n/a	Not Accredited

DETSC 2019	Loose Packed Dry Soil Density	Dried, ground soil is transferred to a dry, tared measuring cylinder and the volume recorded. The cylinder and its contents are then weighed and the density of the soil calculated.	BS3882:2007 Specification for Topsoil	n/a	Not Accredited
DETSC 2024	Sulphide in Soil and Water by Iodometry	Hydrogen sulphide is liberated by acidification of the sample with hydrochloric acid in a steam distillation unit. The hydrogen sulphide produced is carried over with the steam and is absorbed in alkaline zinc acetate. The zinc sulphide produced reacts with iodine formed when iodate-iodide is acidified and the excess iodine titrated with standard thiosulphate.	In House Method based on: Environment Agency - The determination of easily liberated sulphide in soils and similar matrices (2010) - Blue Book 228 Method D - The determination of easily liberated sulphide in as received or air-dried samples following acid steam distillation with iodometric titration The determination of sulphide in waters and associated materials (2007) Draft Method D - The determination of easily liberated sulphide in as received or air-dried samples following phosphoric acid steam distillation with iodometric titration.	Soils: 10mg/kg Waters: 250ug/l	Not Accredited
DETSC 2025	Volatile Fatty Acids in Waters and Sludges	Volatile fatty acids are esterified with acidic ethylene glycol. The resultant esters are reacted with hydroxylamine to form hydroxamic acids. Addition of iron (II) chloride causes formation of purple coloured ferric hydroxamates which are determined spectrophotometrically at 500nm.	Determination of Volatile Fatty Acids in Environmental Aqueous Samples - Polish Journal of Environmental Studies Volume 17, No. 3 (2008), 351-356. Volatile Fatty Acids Production By Anaerobic Fermentation Of Urban Organic Wastes - C. Sans, J. Mata-Alvarez, Department of Chemical Engineering, University of Barcelona Determination of Volatile Fatty Acids in Sewage Sludge - Methods for the Examination of Waters and Associated Materials Book 21 ISBN 011-751462-4	20mg/l	Not Accredited
DETSC 2026	AOC, pH and Alkalinity of Solid Soaps and Detergents	A representative portion of the sample is weighed out and dissolved in water. The pH is measured on the liquid produced using a calibrated pH meter. The same solution is then titrated with standard sulphuric acid using methyl orange as an indicator and from this result the alkalinity is calculated. The active oxygen content is measured by digesting the sample with sulphuric acid and then titrating with potassium permanganate solution.	ISO 4321:1977 - Washing Powders - Determination of AOC - Titrimetric Method	TBC	Not Accredited
DETSC 2030	Alkalinity in Water	The alkalinity of a sample of water or leachate is determined by potentiometric or indicator end point titration with a strong acid from sample pH to pH 8.3 (where applicable) and then to pH 4.5. From the titres obtained the total alkalinity and concentrations and types of alkalinity present can be calculated.	SCA Method ISBN 0 11 751601 5 The Determination of Alkalinity and Acidity in Water 1981 Instruction Manual for Skalar SP50 Robotic Analyser	20mg/l as CaCO ₃	UKAS
DETSC 2031	5 Day Biochemical Oxygen Demand	The sample, either diluted or undiluted, is placed in a BOD bottle and the initial dissolved oxygen content of the sample is measured using a dissolved oxygen meter. The bottle is placed in an incubator at 20°C in the dark for 5 days. After this time the bottle is removed and the residual dissolved oxygen content of the sample is measured. The BOD of the sample is calculated from the reduction in the concentration of dissolved oxygen over 5 days.	SCA Method ISBN 0 117522120 5 Day Biochemical Oxygen Demand (BOD5) Second Edition 1988	1 mg/l	UKAS
DETSC 2032	Chemical Oxygen Demand	Oxidisable substances react with sulphuric acid - potassium dichromate solution in the presence of silver sulphate as a catalyst. Chloride is masked by mercury sulphate. The reduction in the yellow colouration of Cr ⁶⁺ is evaluated using a spectrophotometer for the low range tubes (LCK 314) whilst the green colouration of Cr ³⁺ is evaluated for the medium and high range tubes (LCK 014 and LCK 114).	Environment Agency The determination of chemical oxygen demand in waters and effluents (2007) Methods for the Examination of Waters and Associated Materials	10 mg/l	UKAS MCERTS - Trade Effluent ONLY
DETSC 2033	Total and Dissolved Organic Carbon in Water	The term TOC (Total Organic Carbon) is used to describe the total content of organically bound carbon in dissolved and undissolved compounds. The TOC content is expressed in mg/l. If DOC (Dissolved Organic Carbon) is required, samples are filtered through a 0.45µm filter paper prior to analysis. Inorganic carbon is expelled by acidification of the sample. TOC is then determined by digestion of the sample with sulphuric acid and peroxodisulphate. Carbon containing compounds are transformed into carbon dioxide. The carbon dioxide evolves and reacts with an indicator solution. The colour change is measured using a spectrophotometer.	Hach-Lange Technical Instructions: LCK 385, LCK 386	2 mg/l	UKAS
DETSC 2034	Suspended and Settleable Solids in Water	Suspended matter is removed from a measured volume of sample by filtration under reduced pressure through a pre-treated, pre-weighed glass fibre filter paper. The paper is washed with deionised water to remove dissolved salts and the total suspended matter is determined gravimetrically after drying at 105 ±5°C. Settleable solids are determined by subtracting the solids left in suspension after settlement for 1 hour (or other agreed time) from the total suspended matter in the sample.	SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980	5 mg/l	Suspended Solids: UKAS Settleable Solids: Not Accredited

DETSC 2035	Total Solids, Total Dissolved Solids and Total Volatile Solids in Water	<p>For total dissolved solids determination: Water samples are pre-filtered to remove any suspended solids and evaporated in an oven at 180°C. The amount of residual dissolved solids is determined gravimetrically. An estimate of the total dissolved solids can be obtained by measuring the conductivity of the sample and performing an empirical calculation from the conductivity obtained.</p> <p>For total solids and total volatile solids: The sample is shaken to ensure homogeneity of any suspended matter. The sample is then evaporated and the result is determined gravimetrically as for total dissolved solids. If total volatile solids is required on the sample, the container used for the total solids determination is retained and heated in a muffle furnace to 440°C and a further gravimetric determination is made.</p>	<p>SCA Method ISBN 011 751957 X Suspended, Settleable and Total Dissolved Solids in Waters and Effluents 1980.</p> <p>BS1377: Part 3 : 1990 Section 8</p>	5 mg/l	Total Dissolved Solids: UKAS Total Solids & Total Volatile Solids: Not Accredited
DETSC 2036	Combustibility of Solids	A representative sample of 10 to 20g of the material to be tested is placed on a gauze mat and heated using a blowtorch. The sample is observed during and after heating and a determination of the behaviour of the sample during the test is made using a standard set of definitions.	EN ISO 1182:2010 Reaction to Fire Tests for Products – Non-Combustibility Test	n/a	Not Accredited
DETSC 2037	Turbidity in Waters	Samples are measured on a turbidity meter. The instrument measures turbidity in the sample by passing light at a wavelength of 860nm through a glass vial containing the liquid to be analysed. Light scattered by the sample is detected at an angle of 90° by a photo-diode and a result is displayed on the instrument screen, with results being based on a set of calibration standards for which the instrument stores a calibration graph.	Standard Methods for the Examination of Water and Wastewater 21st Edition	1.00 NTU	Not Accredited
DETSC 2038	Total and Free Chlorine in Water	The sample is reacted with diethyl-p-phenylenediamine (DPD) in an ethylene diamine tetra-acetic acid (EDTA) buffer for free chlorine. For total chlorine analysis, potassium iodide is added as well to break down any chloramine compounds in the sample so that the chlorine is released to react with the DPD. Samples for both tests are then analysed colourimetrically at a wavelength of 510nm using a small bench top photometer.	Methods for the Examination of Waters and Associated Materials - Chemical disinfecting agents in waters and effluents (2008)	0.1mg/l	Not Accredited
DETSC 2039	Cation Exchange Capacity of Soil	The sample is saturated with Ba ²⁺ ions by mixing with a barium chloride solution. The barium is then exchanged with Mg ²⁺ by reaction with magnesium sulphate forming a precipitate of barium sulphate. The quantity of Mg ²⁺ ions adsorbed (i.e. the CEC value) is determined by loss from magnesium sulphate solution added. This is determined by titration with an ethylene diamine tetra-acetic acid solution using eriochrome black as an indicator.	CEC & Kd Determination in Landfill Performance Evaluation - A review of methodologies and preparation of standard materials for laboratory analysis. BaCl ₂ /triethanolamine method. PR: P1/254/01	1 meq/100g	Not Accredited
DETSC 2040	Sediment Oxygen Demand	The sample to be analysed is placed into a BOD bottle and covered with water saturated with oxygen, which also contains nutrients to promote bacterial growth. The oxygen level in the supernatant liquid is monitored for up to three hours. From the decrease in oxygen content of the supernatant liquid, the SOD rate can be determined.	<p>Nutrient Release and Sediment Oxygen Demand in a Eutrophic Land-Locked Embayment in Hong Kong – Environment International Journal Volume 26 (2001)</p> <p>Sediment Oxygen Demand and Biochemical Oxygen Demand: Patterns of Oxygen Depletion in Tidal Creek Sites - Program in Marine Science, University of North Carolina at Wilmington (2003)</p>	n/a	Not Accredited
DETSC 2047	Formaldehyde in Water	Formaldehyde in soil is extracted in water, with a water to soil ratio of 10:1. The insoluble residue is removed by filtration prior to analysis. Waters are filtered prior to analysis to remove any particulates in suspension. Formaldehyde in the extract or water sample reacts with chromotropic acid-sulphuric acid solution to form a purple coloured complex. The absorbance of the coloured solution is read at 580nm using a suitable visible spectrophotometer.	Formaldehyde by visible absorption spectrophotometry – Method 3500, Issue 2 – NIOSH Manual of Analytical Methods, Fourth edition, August 1994	<p>Soil: 0.2mg/kg</p> <p>Water: 20µg/l</p>	Not Accredited
DETSC 2048	Dissolved Oxygen Content of Water	The dissolved oxygen content of the sample is measured using a dissolved oxygen meter either electrochemically or by fluorescence, or by the titrimetric method developed by Winkler.	<p>SCA Method ISBN 0.11 751442X.</p> <p>Dissolved Oxygen in Natural and Waste Waters 1979</p>	0.1 mg/l	Not Accredited
DETSC 2055	Anions in Water and Aqueous Soil Extracts by Ion Chromatography	Liquid samples and aqueous soil extracts are filtered through a 0.22µm syringe filter prior to analysis. The filtered samples are injected into an Ion Chromatograph. The anions of interest are separated on the basis of their affinity for the active sites of the column packing material. The separated anions are converted into their highly conductive acid forms and measured by conductivity. The anions are identified on the basis of retention time as compared to standards and quantisation is by measurement of peak area.	Standard Methods for the Examination of Water and Wastewater Section 4110 21st Edition 2005 APHA, AWWA, WEF	<p>Soil: 1.0 mg/kg</p> <p>Water: 0.1 mg/L</p>	UKAS (except Br)
DETSC 2065	Cement Content of Concrete and Mortar	The concrete or mortar sample is dried and finely crushed, then digested with hydrochloric acid and filtered to remove the remaining solids, collecting the filtrate for further analysis. The remaining solids are then re-digested using an alkaline solution of sodium carbonate and ammonium chloride and re-filtered. The resulting filtrate is combined with that produced during the first stage of the extraction which is then analysed for calcium and silicon contents by ICP-OES. The remaining solids are ashed at 800°C to determine the insoluble residue content of the sample. A loss on ignition of the original sample is also performed. From these results a series of calculations can be made to determine the soluble silica, calcium oxide and cement content of the sample.	BS1881:Part124:1988 Methods for analysis of hardened concrete	n/a	Not Accredited
DETSC 2066	Gypsum Content of Soil by Acetone Precipitation	The sample is mixed with water and filtered. The filtrate is then mixed with acetone to precipitate out the gypsum. The precipitate is separated out using a centrifuge then re-dissolved in water. The conductivity of the resulting solution is measured from which the gypsum content is calculated.	ASTM C 471M-01 Standard Test Methods for Chemical Analysis of Gypsum and Gypsum Products	TBC	Not Accredited
DETSC 2067	Rapid Chemical Test for Detecting High Alumina Cement Concrete	This is an empirical test to determine the presence or absence of high alumina cement in the sample, it does not provide a quantitative result. The sample is reacted with Oxine reagent in acidic solution. If high alumina cement is present, a yellow precipitate is formed.	BRE Centre for Concrete Construction Special Digest 3 – HAC Concrete in the UK: Assessment, Durability Management, Maintenance and Refurbishment	n/a	Not Accredited

DETSO 2073	Acid Neutralisation Capacity of Soils and Other Solids	ANC is a measure of the buffering capacity of soils and other waste materials. The analysis measures the amount of acid required to bring the sample to a fixed pH. The initial pH of the sample extract must be measured before analysis begins. Analysis is performed by the addition of acid in conjunction with pH measurement by pH meter until the specified pH has been reached as indicated by the meter. The result is expressed in mol/kg (dry wt).	Annex B (Preliminary determination of the acid/base consumption) – CEN/TC 292 – WI 292046 – Characterization of waste – Leaching behaviour tests – Acid and Base neutralization capacity test	1.0 mol/kg	Not Accredited
DETSO 2076	Sulphate and Magnesium Content of 2:1 Aqueous Extract of Soil by ICP-OES	The sulphate and magnesium in the soil are extracted in an aqueous extract having water: soil ratio of 2:1 and the insoluble material is removed by filtration. The concentrations of sulphate and magnesium in the filtrate are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelengths used for identification and quantification are 181.972nm for sulphate and 285.213nm for magnesium.	BS1377 : Part 3: 1990 Method 5 BS1377 : Part 1: 1990 TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1:2005 Concrete in Aggressive Ground 2005	10mg/L	Sulphate: MCERTS(Soils) Magnesium: Not Accredited
DETSO 2084	Total Organic Carbon by PrimacATC Analyser	Soil samples are treated with phosphoric acid to expel any inorganic carbonates. The samples are then heated at high temperature in a continuous flow of air so that any organic carbon is oxidised to carbon dioxide. The gas is then allowed to cool and analysed by an infra-red detector.	PrimacATC Analyser – User Manual, Skalar	0.47%	MCERTS(Soils)
DETSO 2085	Total and Dissolved Organic Carbon in Water	Direct TOC Analysis - The sample is acidified, stirred and purged to remove the IC before the sample is injected and handled as in the TC Analysis. The sample is filtered before acidification for DOC. TC Analysis - The sample is injected by an automated septum less rotary port into a high temperature reactor. In the reactor, at a temperature of 750 - 950°C all organic and inorganic carbon is oxidized to the gaseous carbon dioxide (CO ₂). The catalyst that is present in the reactor catalysis the oxidation to completion. A flow of air transports these oxidation products to the detectors. The oxygen required for reaction is taken from the airflow. The products are led into the non-dispersive infrared detector where the carbon dioxide is determined. The carbon dioxide is measured at a wavelength of 4.2 µm by NDIR detection.	Standard Methods for the Examination of Water and Wastewater Section 5310 B 21st Edition 2005 APHA, AWWA, WEF. HMSO Methods for the Examination of Waters and Associated Materials – The Instrumental Determination of Total Organic Carbon and Related Determinands 1995	lmg/l as C	UKAS
DETSO 2119	Exchangeable Ammonia in Soil	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	MAFF/ADAS Reference Book 427 – the Analysis of Agricultural Materials – Method 53, Ammonium, Nitrate and Nitrite-Nitrogen, Potassium Chloride Extractable	0.5mg/kg	MCERTS(Soils)
DETSO 2120	Ammonia in Water by Spectrophotometry	An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, with sodium nitroprusside acting as a catalyst. The complex is measured at 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.	Environment Agency Ammonia in Waters 1981 ISBN 0117516139. Methods for the Examination of Waters and Associated Materials	20µg/l	UKAS
DETSO 2121	Total Kjeldahl Nitrogen Content of Soils and Waters	The sample is digested with sulphuric acid and a mixture of catalysts to convert organic nitrogen to ammonia. The sample is then distilled under alkaline conditions, and the distilled ammonia is absorbed in sulphuric acid. The ammonia content of the distillate is then determined colorimetrically either using the UV/vis spectrophotometer or the Konelab 60i. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm	The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427 – HMSO. BS 3882: 2007 Specification for topsoil. Standard Methods for the Examination of Water and Wastewater Part 4500-N, 21st Edition 2005 APHA, WWA, WEF	Soil: 0.01% Water: 2mg/l	Not Accredited
DETSO 2122	UV Light Transmittance in Waters	The absorbance of a water sample is measured at a wavelength of 254nm in a 10mm glass or quartz cell using deionised water as a blank. The percentage UV transmission of the sample is then calculated from the absorbance result.	Ultraviolet Light Factsheet - Treatment of Residential Drinking Water Using UV – Water Quality Association	n/a	Not Accredited
DETSO 2123	Water Soluble Boron in Soil & Boron in Water	Boron in soil is extracted in boiling saline water. Waters are filtered prior to analysis to remove any particulates in suspension. The water soluble boron in the extract or filtrate reacts with azomethine-H to produce a yellow coloured complex. The resulting colour absorbance is measured at 420nm using a suitable visible spectrophotometer.	SecondSite Property (now National Grid Property Holdings) - Guidance for assessing and managing potential contamination on former gasworks and associated sites (Part 1) (Version 3) Method 17.12 The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	Soil: 0.2mg/kg Water: 100ug/L	MCERTS(Soils)
DETSO 2124	Reactive Aluminium in Waters and Leachates	Aluminium reacts with Catechol violet in a suitably buffered solution (pH 6.1) to form an aluminium–catechol violet complex which can be measured photometrically at 575nm.	KonelabAquaChemLabmedics Method No. ALLU001. Standard Methods for the Examination of Water and Wastewater. Part 3111 B – 21stEdition, 2005 APHA, AWWA, WEFT	3µg/l	Not Accredited

DETS 2125	Colour in Water	A filtered (true colour) or unfiltered (apparent colour) sample is analysed on a UV / Visible Spectrometer at 455nm and the result compared against a PtCo Calibration.	HACH - Water Analysis Handbook – Method 8025 Color, True and Apparent. APHA – Standard Methods for the Examination of Water & Wastewater 2005 - 2120 COLOR	1mg/l	Not Accredited
DETS 2126	Methylene Blue Active Substances	Methylene Blue is much more readily soluble in water than in chloroform, however in the presence of anionic surfactants an ion-pair is formed which is readily extracted into chloroform. The sample is mixed with chloroform and methylene blue solution in a separating funnel. The resultant colour change in the chloroform layer is measured on a spectrophotometer at a wavelength of 654nm.	Koga, Yamamichi, Nomoto et al. Analytical Sciences 15, 563-568 (1999)	0.01mg/l	Not Accredited
DETS 2127	Acidity, Dissolved CO2 and Aggressive CO2 in Water	Samples requiring acidity or aggressive CO2 are first digested by heating the sample with sulphuric acid and hydrogen peroxide. Samples for acidity analysis are then titrated with sodium hydroxide to pH 8.3 for total acidity or to pH 3.7 for mineral acidity. For aggressive and dissolved CO2 samples are titrated with sodium hydroxide to pH 8.3. The aggressive or dissolved CO2 in the sample is then calculated from the titration result.	USEPA – Method 305.1 Acidity HMSO – The Determination of Alkalinity and Acidity in Water 1981	10mg/l	Not Accredited
DETS 2130	Cyanides & Monohydric Phenols by Skalar	Water samples are filtered through a 0.45µm syringe filter and solid samples are extracted with 1M caustic soda prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-001 w/r+P7, I295-002 w/r+P7, 293-902 w/r+P7, 497-001	Soils mg/kg: Total & Free CN=0.1, Thio=0.6, Phenol=0.3 Waters µg/L: Total CN=40, Free CN=20, Thio=20, Phenol=100	Soils: MCERTS Waters: UKAS
DETS 2131	Low Level Cyanides & Monohydric Phenols by SKALAR	Water samples are filtered through a 0.45µm syringe filter prior to analysis on the automated flow analyser. The method determines total cyanide, easily liberated cyanide, complex cyanide, thiocyanate and monohydric phenols.	Skalar methods: I295-003w/r - Free Cyanide, I295-004w/r - Total Cyanide, 497-001 - Phenol	Total CN=0.1µg/l Free CN=0.1µg/l Phenol=1.5µg/l	UKAS
DETS 2140	Sugar in Mixing Water for Cement	Waters are filtered prior to analysis to remove any particulates in suspension. The sugar in the filtrate reacts with phenol and sulphuric acid to produce a yellow-orange coloured complex. The resulting colour absorbance is measured at 490nm using a suitable visible spectrophotometer.	Colorimetric Method for Determination of Sugars and Related Substances. MICHEL DUBOIS, K. A. GILLES, J. K. HAMILTON, P. A. REBERS, and FRED SMITH - Division of Biochemistry, University of Minnesota, St. Paul, Minnesota.	10mg/l	Not Accredited
DETS 2141	Acid Base Accounting & Neutralisation Potential of Soils	Carbonate content and Sulphur content are first determined on the sample using the current DETS methods (DETS 2005 and DETS 5017 respectively). Hydrochloric acid is then added to the sample, the amount being based on the initial carbonate content of the sample. After 22 hours the pH of the sample is checked. If pH is above 2.5 a further addition of acid is made to bring the pH down to around 2.0. Sample is then left to stand for a further 2 hours. Excess acid is then titrated with sodium hydroxide solution, and from this result the neutralisation potential of the sample is calculated. The acid potential of the sample is calculated from the sulphur content of the sample. Further calculations can then be performed using these results to give the neutralisation potential ratio and net neutralisation potential.	BSIPD CEN/TR 16363:2012 Characterisation of Waste – Kinetic testing for assessing acid generation potential of sulphidic waste from extractive industries. BS EN 15875:2011 Characterisation of Waste – Static test for determination of acid potential and neutralisation potential of sulphidic waste.	None available	Not Accredited
DETS 2142	Acid Soluble Fluoride in Soils and Sludges	Samples are tested on an 'as received' basis, without drying and crushing, as fluoride is very volatile and may be lost during normal sample preparation procedures. Samples are treated with sulphuric acid and a mixture of sodium citrate and potassium chloride buffer solutions. The fluoride ions released are then measured potentiometrically using a fluoride ion selective electrode.	Fluoride in Waters, Effluents, Sludges, Plants and Soils 1982 (HMSO Publication ISBN 0117516627	1mg/kg	Not Accredited
DETS 2143	Partition Coefficient of Soil (Kd Value)	The sample to be tested is first equilibrated with water (or any other solvent of interest) by mixing for a set time period (usually 72 hours). A spiking solution containing the compound or element of interest is then added to give a known concentration in the sample and then mixed for a further 48 hours. Analysis is then performed on the spiked samples by a standard method for the compound of interest. An un-spiked portion of the sample is extracted and analysed at the same time and the Kd value is calculated from the results obtained.	Environment Agency Science Report SC020039/4 – Development of the partition coefficient (Kd) test method for use in environmental risk assessments	TBC	Not Accredited
DETS 2144	Baumann-Gully Acidity in Soils	The dried and crushed sample is treated with sodium acetate to produce acetic acid. The acid produced is titrated with standard sodium hydroxide solution to give an indication of the acidity potential of the sample.	BS EN 16502: 2014 – Test method for the determination of the degree of soil acidity according to Baumann-Gully	TBC	Not Accredited

DETSO 2201	Nitrite in Waters and Leachates by Colourimetric Analysis	Nitrite is determined colorimetrically using the Konelab60i autoanalyser. The nitrite colour reaction occurs at pH 2.0 to 2.5 by coupling diazotized Sulphanilamide with N-1-naphthyl-ethylenediamine. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Nitrite in Waters Iss No 2. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 354.1 Nitrite, spectrophotometric (Approved at 40 CFR Part 136, not approved at Part 141)	0.04mg/l (as N)	UKAS
DETSO 2202	Total Oxidised Nitrogen in Waters and Leachates by Colourimetric Analysis	Nitrate is reduced to nitrite by hydrazine under alkaline conditions. The total nitrite ions are then reacted with sulphanilamide and N-1-naphthylethylenediamine dihydrochloride under acidic conditions to form a reddish purple azo-dye. The absorbance of this compound is measured spectrophotometrically at 540 nm using the Konelab 60i autoanalyser.	Standard Methods for the Examination of Water and Wastewater Part 4500-NO2 B and Part 4500-NO3 H – 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method Total Oxidised Nitrogen. Methods for the Examination of Water and Associated Materials Oxidised Nitrogen in Waters 1981. EPA Method 353.1 Nitrate, Nitrite Colorimetric Automated Hydrazine Reduction (Approved at 40 CFR Part 136, Not approved at Part 141)	0.7mg/l (as N)	UKAS
DETSO 2203	Hexavalent Chromium in Waters and Leachates by Colourimetric Analysis	Hexavalent Chromium is determined colorimetrically using the Konelab 60i autoanalyser. Hexavalent chromium reacts with diphenylcarbazide in acid solution and produces a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm.	Standard Methods for the Examination of Water and Wastewater Part 3500-Cr – 21st Edition 2005 APHA, AWWA, WEF. USEPA 7196-A. Aquakem Method. Hexavalent Chromium	10µg/l	UKAS
DETSO 2204	Hexavalent Chromium in Soil by Colourimetric Analysis	Hexavalent Chromium is determined colorimetrically using the Konelab 60i or Smartchem 600 autoanalyser. Hexavalent chromium reacts with diphenylcarbazide in acid solution producing a red-violet colour. The absorbance of this compound is measured spectrophotometrically at 540nm	Aquakem Method. Hexavalent Chromium	1mg/kg	Not Accredited
DETSO 2205	Reactive & Total Phosphorus in Waters and Leachates by Colourimetric Analysis	Phosphate is determined colorimetrically using the Konelab 60i or Smartchem 600 autoanalyser. The orthophosphate ion reacts with ammonium molybdate and antimony potassium tartrate under acidic conditions to form a 12-molybdophosphoric acid complex. The complex is then reduced with ascorbic acid to form a blue heteropoly compound. The absorbance of this compound is measured spectrophotometrically at wavelength 880nm. The Konelab 60i analyses a series of manually prepared standards. An intermediate calibrator is diluted by the Smartchem 600 autoanalyser, to produce a series of standards. These standards are used to produce a calibration graph. Filtered samples are analysed and the phosphate content determined by comparison of the sample absorbance with the calibration graph. Samples for total phosphate analysis are digested by boiling with sulphuric acid and ammonium metavanadate, then analysed as above.	Standard Methods for the Examination of Water and Wastewater Part 4500-P E– 21st Edition 2005 APHA, AWWA, WEF. Aquakem Method. Phosphate in Waters Issue 2	0.01mg/l	Reactive Phosphorus: UKAS Total Phosphorus: Not Accredited
DETSO 2207	Ammonia in Waters and Leachates by Colourimetric Analysis	NOTE THAT AMMONIA ANALYSIS IS PERFORMED IN TWO STAGES USING A HIGH-RANGE METHOD AND A LOW-RANGE METHOD. ALL SAMPLES ARE ANALYSED BY THE HIGH-LEVEL AMMONIA METHOD FIRST. SAMPLES THAT GIVE AN AMMONIA RESULT BELOW 2.5mg/l WILL AUTOMATICALLY BE ANALYSED BY THE INSTRUMENT USING THE LOW-LEVEL AMMONIA METHOD. Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm and is related to the ammonia concentration by means of a calibration curve. The Konelab 60i analyses a series of manually prepared standards for low-range ammonia analysis and prepares a series of calibration standards from a single stock solution for high-range analysis. The Smartchem 600 single stock solutions to prepare standards for both analysis ranges. These standards are used to produce a calibration graph. The ammonia content in the analysed samples is determined by comparison of the sample absorbance with the calibration graph.	Methods for the Examination of Waters and Associated Materials Ammonia in Waters 1981 ISBN 0117516139. Aquakem Method. Ammonia in Waters Issue 2	0.015mg/l	UKAS
DETSO 2208	Sulphide in Waters and Leachates by Colourimetric Analysis	Sulphide is determined colorimetrically using the Konelab60i autoanalyser. Potassium Dichromate converts N-N-Diethyl-p-phenylenediamine to the free radical which reacts rapidly with sulphide to produce the coloured 'DPD Blue' or 'Ethylene Blue'. The absorbance can then be measured at wavelength 660nm.	The determination of sulphide in waters and associated materials (2007) - SCA - Draft (March 2007). Aquakem Method. Sulphide SP001 Issue 2. Standard Methods for the Examination of Water and Wastewater, 21st Edition 2005, Part 4500. ISBN0-87553-223-3	10µg/l	UKAS

DETS 2210	Ferrous Iron in Waters and Leachates by Colourimetric Analysis	Three molecules of phenanthroline chelate with each atom of ferrous iron to form an orange/red complex. The intensity of the coloured solution is stable between pH3 to pH9. Rapid colour development occurs between pH2.9 and pH3.5 in the presence of excess phenanthroline. The resulting colour absorbance is measured at 510nm	Aquakem Method Ferrous Iron FIR001 Issue 2	0.1mg/l	Not Accredited
DETS 2211	Silicate in Waters and Leachates by Colourimetric Analysis	Reactive forms of silicon in acid solution, below pH2, react with ammonium molybdate ions to form a yellow silicomolybdate. Ascorbic acid reduces the yellow silicomolybdate to produce a blue silicomolybdate complex. Oxalic acid is added to destroy any molybdophosphoric acid formed.	ASTM D7126 - 10 Standard Test Method for On-Line Colorimetric Measurement of Silica. Aquakem Method Silica SIL Issue 2	0.25mg/l	Not Accredited
DETS 2212	Chloride Content of Waters and Leachates by Colourimetric Analysis	Chloride reacts with mercury (II) thiocyanate to form a soluble non-ionic compound. The thiocyanate ions released react in acid solution with iron (III) nitrate to form a red/brown iron (III) thiocyanate complex. The resulting intensity of the stable colour produced is measured spectrophotometrically at a wavelength of 480nm and is related to the chloride concentration by means of a calibration curve.	EPA Method 325.1 Chloride Colorimetric, Automated Ferricyanide, Automated Analyzer I	10mg/l	Not Accredited
DETS 2301	Metals in Soil by ICP-OES As, Ba, Be, Cd, Cr, Co, Cu, Fe, Mn, Mo, Ni, Pb, Se, V, Zn	Metals in soils and associated materials are extracted by boiling in a mixture of hydrochloric and nitric acids. The metal concentrations in the sample extract are determined by inductively coupled plasma optical emission spectroscopy (ICP-OES).	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005, AWWA, WEF	mg/kg: As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	UKAS (all listed) MCERTS (All soils listed except Fe)
DETS 2303	Total Hardness (By Calculation)	The concentrations of calcium and magnesium are determined by following the procedures given in DETS 2306 - Metals in Waters By ICP-MS. The hardness is calculated from the results obtained.	Standard Methods for the Examination of Water and Wastewater Part 3120 B – 21st Edition 2005 APHA, AWWA, WEF	n/a	UKAS
DETS 2304	Zinc Equivalent in Soil (By Calculation)	The concentrations of copper, nickel and zinc concentrations are determined using the appropriate methodologies. The zinc equivalent is a measure of the combined toxicity of the three metals, relative to the toxicity of zinc.	In-house Method	n/a	Not Accredited
DETS 2306	Metals in Waters by ICP-MS Ag, Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sn, V, Zn	Concentrations of metals in water are determined by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS). Any metals not listed can be determined but are not accredited under UKAS.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEF	High Level µg/l: Ag=0.13, Al=10.0, As=0.16, Ba=0.26, Ca=90, Cd=0.03, Co=0.16, Cr=0.25, Cu=0.40, Fe=5.50, Hg=0.01, K=80, Mg=20, Mn=0.22, Mo=1.1, Na=70, Ni=0.50, P=18.0, Pb=0.09, Sb=0.17, Se=0.25, Sn=0.40, V=0.60, Zn=1.3 Low Level µg/l Al=10.0, Cd=0.02, Cr=0.25, Cu=0.21, Fe=6.50, Ni=0.31, P=3.0, Pb=0.09, Zn=0.50	High Level Dissolved: UKAS (all listed except Mo, Sn) High Level Total: Not Accredited Low Level Dissolved: UKAS (Al, Cd, Cr, Cu, Fe, Ni, Pb, Zn) Low Level Total: UKAS (Al, Cd, Cr, Cu, Fe, Ni, P, Pb, Zn)
DETS 2307	Boron, Sulphur and Tin Content of Waters and Leachates by ICP-OES	Filtered water and leachate samples are analysed for boron, sulphur and tin content by ICP-OES. The wavelengths used for the determination are 249.772nm for boron, 181.972nm for sulphur and 189.925nm for tin.	Standard Methods for the Examination of Water and Wastewater Part 3125 B – 21st Edition 2005 APHA, AWWA, WEFT	Boron: 5µg/l Tin: 17µg/l Sulphur: 0.65mg/l	Not Accredited
DETS 2308	Copper, Nickel and Zinc Content of Topsoil	Dried and crushed soil samples are digested on a temperature controlled hotblock with hydrogen peroxide and nitric acid. The digested sample is then filtered and made up to a set volume before analysis for copper, nickel and zinc by ICP-OES.	BS 3882 – Specification for Topsoil	Copper: 0.40mg/kg Nickel: 0.65mg/kg Zinc: 0.65mg/kg	Not Accredited
DETS 2309	Extractable Magnesium and Potassium in Soil by ICP-OES	Extractable metals in soil are extracted by shaking the soil in 1M Ammonium Nitrate for 30 minutes. The concentration of each metal extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited
DETS 2310	Extractable Phosphorus in Soil by ICP-MS	Extractable phosphorus in soil is extracted by shaking the soil in 0.5M Sodium Hydrogen Carbonate for 30 minutes. The concentration of phosphorus extracted is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS 3882:2015 - Specification for topsoil. The Analysis of Agricultural Materials – MAFF/ADAS Reference Book 427	n/a	Not Accredited

DETS 2311	Water Soluble Boron in Soil by ICP-OES	The sample is mixed with boiling water and then heated on a hotblock for 20 minutes. The sample is then filtered to remove the solid materials and then analysed for boron by ICP-OES at a wavelength of 249.772nm.	The analysis of Agricultural materials MAFF/ADAS – reference book 427 HMSO	0.20mg/kg	Not Accredited
DETS 2312	Metals in Oils by ICP-OES	The sample is first oxidised using potassium permanganate and sulphuric acid. The oxidised sample is then digested in aqua regia on a hotplate, followed by analysis of the extract by ICP-OES.	US EPA Method 3031 – Acid Digest of Oils for Metals Analysis	mg/kg: As, Be Cu =0.2, Ba=1.5, Cd=0.1, Cr=0.15, Co=0.7, Mn=20, Mo=0.4, Pb=0.3, Fe=12, Se=0.5, V=0.8, Ni, Zn=1.0	Not Accredited
DETS 2320	Total Sulphur in Soil and Aggregate by ICP-OES	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H ₂ S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. Aggregate analysis is not comparable to BS EN 1744.	TRL 447 Sulphate Specification for Structural Backfills 2005. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	UKAS (Soils) Not Accredited (Aggregates)
DETS 2321	Total Sulphate Content of Soil and Aggregate by ICP-OES	The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Aggregate analysis is not comparable to BS EN 1744.	BS1377 : Part 3: 1990 Method 5. BRE SD1 Concrete in Aggressive Ground 2005	0.01%	MCERTS(Soils) Not Accredited (Aggregates)
DETS 2322	Total Potential Sulfate and Total Oxidisable Sulphur (By Calculation)	Sulphur compounds in soil are extracted using aqua regia and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H ₂ S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The wavelength used for identification and quantification of sulphate is 181.972nm. The sulphate in the soil is extracted in dilute hydrochloric acid and the insoluble residue is removed by filtration. The filtrate is made up to volume and the concentration of sulphate in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelength used for identification and quantification of sulphate is 181.972nm. The two results obtained from the above tests may then be combined to calculate the Total Potential Sulphate and Total Oxidisable Sulphur content	BS1377 : Part 3: 1990 Method 5. BS1377 : Part 1 : 1990	0.01%	Not Accredited
DETS 2324	Mercury in Waters by Atomic Fluorescence Spectroscopy	Waters and aqueous samples are preserved by fixing with concentrated nitric acid. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry. For low level analysis, samples are filtered for dissolved mercury, but left un-filtered for total mercury. Samples are then digested with hydrochloric acid and bromide solution before analysing as above.	Standard Methods for the Examination of Water and Wastewater Part 3112 B – 21st Edition 2005 APHA, AWWA, WEF. PSA Method – Millennium Merlin Method for Total Mercury in Drinking, Surface, Ground, Industrial and Domestic Wastewaters and Saline Waters. USEPA Method 1631 – Determination of Low Level Mercury in Water	0.05µg/l 1.00ng/l (low level)	UKAS (Low level ONLY)
DETS 2325	Mercury in Soil Atomic Fluorescence Spectroscopy	The mercury is extracted from soil in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments	0.05 mg/kg	MCERTS(Soils)
DETS 2332 (DRAFT)	Inorganic and Methyl Mercury Speciation	Soils are air-dried and crushed before being subjected to hotblock extraction. Waters and aqueous samples are filtered to remove particulates. An aliquot is treated with bromate-bromide and tin (II) chloride to generate mercury and the mercury is determined by atomic fluorescence spectroscopy.	In-house Method	Soil: 100µg/kg Water: 1µg/l	Not Accredited
DETS 2333	Elemental Mercury Speciation	Soils, waters and aqueous samples are tested on an as-received bases. A known quantity of sample is extracted using argon and the released elemental mercury is trapped. The trapped mercury is released upon heating in a scarifier module and determined by atomic fluorescence spectroscopy.	In-house Method	Soil: 0.6µg/kg Water: 1µg/l	Not Accredited
DETS 2400	Unified Barge Bioaccessible Metals in Soils	The Unified BARGE Method (UBM) is an in vitro method for simulating the human digestive system. Synthetic digestive fluids are used to simulate the fluids present in the body. Both inorganic solutions (Containing inorganic salts such as KCl, NaCl etc), and organic solutions (Containing organic compounds such as Urea, Glucose etc) are mixed with enzymes to produce 4 Synthetic digestive fluids saliva (S), Gastric fluid (G), duodenal fluid (D) and bile (B). These solutions are then used to mimic the effect of a sample passing through a human gastro intestinal tract by shaking portions of the sample at 37°C, human body temperature (17.4).	EPA 9200.2-86 April 2012- Standard Operating Procedure for an In Vitro Bioaccessibility Assay for Lead in Soil. BGS Chemical& Biological Hazards Programme Open Report OR/07/027 - Inter-laboratory Trial of a Unified Bioaccessibility Procedure	V = 1.0mg/kg, Cr = 5.0mg/kg, Co = 1.0mg/kg, Ni = 5.0mg/kg, As = 0.5mg/kg, Se = 0.5mg/kg, Cd = 0.5mg/kg, Pb = 1.0mg/kg	Not Accredited

DETSO 2501	Leachate Preparation by Up-Flow Percolation	The sample to be tested is compacted into a 5cm diameter column. A continuous vertical up-flow of water is then pumped through the sample and the resulting leachate is collected, changing the collection vessel every 24 hours. The leachates are then analysed using existing test methods for the components requested by the client.	Draft British Standard BS EN 14405 – Characterisation of Waste – Leaching Behaviour Test- Up- Flow Percolation Test	n/a	Not Accredited
DETSO 2502	Particle Size Distribution of Topsoils	Samples to be analysed are first air dried at 28±2°C. The dried sample is passed through sieves of 50, 20 and 2mm pore sizes. The portion of the sample passing the 2mm sieve is mixed with a dispersant solution to assist in breaking down any soil aggregates into the component sand/clay/silt particles. The sample is then wet-sieved through a 63µm sieve. The portion of sample passing this final sieve is allowed to settle out and separate into clay and silt fractions. From the weights of sample retained on each sieve and from the settled fractions, the proportions of cobbles, gravel, sand, silt and clay can be determined.	BS 7755 – Soil Quality; Section 5.4: Determination of particle size distribution in mineral soil material – Method by sieving and sedimentation BS 1377 – Soils for civil engineering purposes; Part 2: Classification tests Simplified Method for Soil Particle-Size determination to Accompany Soil-Quality Analyses – Kettler, Doran & Gilbert, American Journal of Soil Science May/June 2001	n/a	Not Accredited
DETSO 3001	Solvent Extractable Matter in Soil	Soil samples are extracted with a water-immiscible solvent and filtered to remove the water. The solvent is evaporated and the amount of extractable matter in the sample is determined gravimetrically.	In-house method based on: - Problems Arising from the Redevelopment of Gas Works and Similar Sites - AERE Harwell Laboratory 1981. Environmental Agency - The Determination of Material Extractable by Carbon Tetrachloride and of Certain Hydrocarbon Oil and Grease Components in sewage Sludge – 1978	40mg/kg	Not Accredited
DETSO 3002	Oil & Grease/Solvent Extractable Matter in Waters	A known volume of sample is acidified to pH<2 and extracted three times with an organic solvent, such as n-Hexane, in a separating funnel. The solvent is removed by evaporation and the amount of extractable matter in the sample is determined gravimetrically.	APHA 21st Edition, 2005 – Method 5520 B. Oil & Grease - Partition Gravimetric Method. USEPA Method 1664, Revision A: n-Hexane Extractable Material (HEM: Oil & Grease) and Silica Treated N-Hexane Extractable Material (SGT-HEM; Non Polar Material) by Extraction and Gravimetry.	1mg/l for 500ml sample	UKAS
DETSO 3049	Elemental Sulphur in Soils and Waters by HPLC	Soils are extracted in dichloromethane (DCM) by sonication. The elemental sulphur concentration is determined by high performance liquid chromatography (HPLC) with UV detection using a C ₁₈ (e.g. 250mm x 4.6mm) column and a mobile phase composed of 95% methanol and 5% water. Waters and aqueous extracts of soils are extracted using DCM in a separating funnel, filtered, and the concentration determined using HPLC.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis: Elemental Sulphur.	Soil: 0.75mg/kg Waters: 90ug/l	Soil: MCERTS Water: UKAS
DETSO 3072	Aliphatic / Aromatic TPH by GC-FID	Aliphatic and aromatic petroleum hydrocarbons (C ₁₀ -C ₃₅) are extracted from soil and water using n-Hexane. The fractions are separated by solid phase extraction using silica columns, whereby the aliphatic fraction is eluted first with n-Hexane and the aromatic portion is eluted second with dichloromethane. The total, aliphatic, and aromatic concentrations are determined by gas chromatography flame ionisation detection (GC-FID) using a capillary column and hydrogen as the carrier gas. The chromatographic data is further characterized by subdivision into approximate boiling point/carbon number ranges with respect to n-alkane retention time markers.	National Grid Property Holdings Limited, Methods for the Collection and Analysis of Samples from National Grid Sites, Version 1, September 2006. Section 3.12 Soil Analysis: Draft TNRCC Method 1006	Soil mg/kg: AL10-12 =1.5, AL12-16 =1.2, AL16-21 =1.5, AL21-35 =3.4, AR10-12 =0.9, AR12-16 =0.5, AR16-21 =0.6, AR21-35 =1.4 Water: 1ug/l	Soil: MCERTS(C10-C35 only) Water: Not Accredited
DETSO 3301	PAH in Soil by GC-FID	Soils and associated materials are extracted in dichloromethane (DCM) using sonication. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m, 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.5 mg/kg each 1.6 mg/kg Total PAH	UKAS (16 PAH's only)
DETSO 3302	Hexane / Acetone Extracted PAH in Soil by GC-FID	Soils are extracted into hexane: acetone by shaking. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m; 0.25µm ID; 0.25µm film) capillary column (or equivalent).	In-house method based on US EPA Method 8100, Polynuclear Aromatic Hydrocarbons	0.1 mg/kg each 1.6 mg/kg Total PAH	Not Accredited
DETSO 3303	Polyaromatic Hydrocarbons in Soils by GC-MS	The PAHs in the soil sample are extracted into hexane: acetone by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision C, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	0.03 mg/kg each 0.10 mg/kg Total PAH	UKAS (All 16 PAH's) MCERTS (not Fluorene, Anthracene, Chrysene or Total)
DETSO 3304	Polyaromatic Hydrocarbons in Waters by GC-MS	The PAHs in the water sample are extracted into dichloromethane by shaking. The PAHs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each PAH is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semivolatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS). In-house method based on EPA Method 3510C- EPA Method 3510C, Revision 3, Separatory Funnel Liquid-Liquid Extraction	10 ng/l each	UKAS (16 PAH's only)

DETS 3311	Extractable Petroleum Hydrocarbons (EPH) in Soil, Ballast and Water	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid and aqueous matrices. This method uses a dichloromethane (DCM) extraction followed by quantification using gas chromatography/ flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10-C24), and "mineral oil range" (C24-C40).	USEPA Method 3550C – Ultrasonic Extraction. USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	Soil: 10 mg/kg Ballast: 10mg/kg Water: 10µg/l	Soil: MCERTS Water: UKAS
DETS 3312	Hexane Extractable Petroleum Hydrocarbons (HPH)	This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid matrices. This method uses a hexane: acetone (9:4) extraction followed by quantification using gas chromatography/ flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C10-C40) and as "Speciated EPH", specified in terms of the "diesel range" (C10- C24) and "mineral oil range" (C24-C40).	USEPA Method 8015B – Non-Halogenated Organics Using GC/FID	Soil: 5 mg/kg	Not Accredited
DETS 3321	BTEX, MTBE & PRO in Soils by Headspace GC-FID	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	0.01 mg/kg	MCERTS(Soils) Not accredited for PRO range (C5-10)
DETS 3322	BTEX, MTBE & PRO in Waters & Leachates by Headspace GC-FID	BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.	EPA Methods 5021 and 8015D	1 µg/l	UKAS
DETS 3401	PCBs in Soils by GC-MS	An as-received soil sample is extracted in Hexane:Acetone (1:2) using sonication methodology. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the instrument software.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	µg/kg PCB 28=1.25 PCB 52=1.12 PCB 101=1.32 PCB 118=1.43 PCB 153=2.08 PCB 138=1.35 PCB 180=1.42	MCERTS(Soils)
DETS 3402	Polychlorinated Biphenols in Waters by GC/MS	The water sample is extracted in DCM on a reciprocal shaker. The sample is separated by gas chromatography and identified by mass selective detector. Quantification is carried out within the GC-MS software using an internal standard.	EPA Method 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography.	ng/l PCB 28=208, PCB 52=161, PCB 101=211, PCB 118+123=513, PCB 153=163, PCB 138=107, PCB 180=132, PCB 105=133, PCB 114=253, PCB 126=399, PCB 156=253, PCB 157=119, PCB 167=248, PCB 169=181, PCB 189=271, PCB 77=202, PCB 81=186.	UKAS
DETS 3421	Organotin Compounds in Soils and Waters by GCMS	Organotin compounds are extracted from soil and liquid samples by shaking with hexane. The extract is derivatised with tetraethyl borate before being analysed by GC MS with selected ion monitoring (SIM).	TBC	Soil: 0.2mg/kg Water: 1µg/l	Not Accredited
DETS 3431	Volatile Organic Compounds in Soils by Headspace GC-MS	The method covers the range of volatile organic compounds with boiling points up to 220°C. Soil samples in salty water are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	0.01mg/kg except: Chloroethane - 0.019mg/Kg Styrene - 0.025mg/Kg	UKAS
DETS 3432	Volatile Organic Compounds in Waters by Headspace GC-MS	The method covers the range of volatile organic compounds with boiling points up to 220°C. Water samples are heated and agitated in a crimp cap vial. This drives the volatile components in to the headspace. An aliquot of the headspace is taken and injected in to a gas chromatograph with mass selective detection (GC-MS).The detector operates in full scan mode and is calibrated with standards containing known concentrations of the compounds of interest.	USEPA Method 8260B Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Revision 2, December 1996	1 ug/l except: DCM (27), 2,2-Dichloropropane (2), Bromochloromethane (4), Bromodichloromethane (4), m-p-Xylene (2), 1,3-Dichlorobenzene (2)	UKAS except: Trichlorofluoromethane, Methylene Chloride, 1,1,1-Trichloroethane,
DETS 3433	Semi-Volatile Organic Compounds in Soils by GCMS	The SVOCs in the soil sample are extracted into DCM: Acetone by shaking. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 0.1 mg/kg	UKAS

DETS 3434	Semi-Volatile Organic Compounds and Pesticides in Waters by GCMS	The SVOCs in the water sample are extracted into DCM using a liquid liquid extraction. The SVOCs in the extract are separated by gas chromatography and identified by the mass selective detector. The concentration of each SVOC is determined by referencing individual mass peak areas to the appropriate internal standard mass peak area. Quantification is carried out within the instrument software.	In-house method based on EPA Method 8270- US EPA Method 8270, Revision 3, Semi volatile Organic Compounds by Gas Chromatography – Mass Spectrometry (GC/MS)	Individual SVOCs: 1mg/l	Not Accredited
DETS 3447	Acid Herbicides in Soils by LCMSMS	Acid herbicides in the sample are extracted with formic acid fortified acetonitrile by shaking. Samples are centrifuged, extracts diluted with mobile phase and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard.	EPA Method 536 EPA Method 615 EPA Method 8151A	35ug/kg	UKAS
DETS 3448	Acid Herbicides in Liquids by LCMSMS	Samples are filtered and directly injected into an LCMSMS. The sample is separated by LC and identified by MSMS detector. Quantification is carried out within the LCMSMS software using an internal standard	EPA Method 536 EPA Method 615 EPA Method 8151A	20ng/l	UKAS
DETS 3451	Phenol and British Gas Phenols in Soils and Waters by GCMS	The phenols in the water sample are extracted by solid phase extraction. Phenol is eluted from the SPE column with DCM evaporated to dryness under nitrogen and re-dissolved in DCM. Soils and associated materials are extracted in dichloromethane: acetone using sonication.	TBC	Phenol Liquids 0.1ug/l Phenol Soils 0.01mg/kg British Gas Phenol Liquids 0.1ug/l British Gas Phenol Soils 0.5mg/kg	Not Accredited
DETS 3501	Target Based Screening of Water Samples by GCMS	This method uses a target MS library that contains over 1000 compounds, including both volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) allowing rapid identification and reporting of organic pollutants in an extracted water sample. This is a semi-quant method. Some of the VVOCs elute either before, or underneath, the DCM solvent peak so can therefore not be identified.	Agilent note 5991-4127EN	0.1ug/l	Not Accredited
DETS 3511	Whole Oil Interpretation	This method is designed to give an interpretation of the type of oil or the type of contamination of oil in solid and aqueous matrices. Neat oil samples, oil samples diluted in dichloromethane (DCM), DCM extract from soil samples, supernatant oil from liquid samples can be tested with method. A product or a solvent extract is directly injected onto a gas chromatograph and is analysed by temperature programmed capillary chromatography and flame ionisation detection (FID). The chromatogram obtained serves as a "fingerprint" of the sample components and allows the determination of the bulk characteristic of the sample. A sample of crude oil and a window definer standard are analysed daily to check the retention times of the n-alkanes and compare to those within the sample. The pattern produced in the sample chromatogram is best matched to a series of 'in-house' reference materials which have been analysed previously under the same GC-FID conditions.	TBC	n/a	Not Accredited
DETS 5002	Ash & LOI Content of Solid Biomass & Solid Recovered Fuels	The ash and LOI content of the sample is determined gravimetrically. A known weight of the sample is placed in a prepared ash crucible and placed in a furnace. The furnace is heated to 550°C ±10°C where the temperature is maintained. Following combustion the crucible and sample are removed, cooled and reweighed.	BS EN 14775:2009. BS EN 15403:2011	0.10%	UKAS
DETS 5003	Volatile Matter Content of Solid Biomass, Solid Recovered Fuels and Coal	A known weight of the sample produced for volatile matter determination is placed in a suitable crucible fitted with a lid. The crucible and sample is weighed and heated in a furnace with a limited air through put at a temperature of 900°C ±10°C for 7 minutes. The sample and crucible are re-weighed and the volatile matter content determined by difference.	BSEN15148:2009 – Solid Biofuels Determination of the Content of Volatile Matter. BS EN 15402:2011 - Solid Recovered Fuels - Determination of the Content of Volatile Matter	0.10%	UKAS (except Coal)
DETS 5004	Total Moisture / Dry Solids Content of Solid Biomass & Solid Recovered Fuels & Coal	The sample produced for general analysis is placed into a suitable prepared and weighed tray and reweighed. The sample is dried at 105°C to constant weight and the total moisture / dry solids content is calculated from the reduction in weight.	BSEN 14774 Parts 1 & 2 2009. DD CEN/TS 15414 Parts 1 & 2: 2010	0.10%	UKAS (except Coal)
DETS 5005	Analysis Moisture Content of Solid Biomass, Solid Recovered Fuels & Coal	The sample produced for total moisture determination in accordance with DETSC 5009 or DETSC 5010 is placed in a suitable pre-weighed tray and reweighed. The sample is then dried at 105°C ±2°C to constant weight and then weighed again. The analysis moisture content is calculated from the reduction in weight.	BS EN 14774-3 2009. BS EN 15414-3 2011. BS 1016-104.1 -1999. ISO 11722 – 1999	n/a	UKAS (except Coal)

DETSC 5007	Calorific Value of Solid Biomass, Solid Recovered Fuels & Coal	Calorific value of a material is determined in an Isoperbol calorimeter by burning it in pure oxygen in a combustion bomb. A known amount of sample is placed in a combustion bomb which is then pressurised to 30bar with oxygen. A calorimeter bucket is filled with a known amount of deionised water which is placed in the calorimeter and the bomb placed in the bucket. The system is allowed to equilibrate and the bomb fired by electrical connection. The difference in temperature of the water in the calorimeter bucket caused by the ignition of the material in the bomb is measured and the calorific value calculated	BS EN 14918: Solid biofuels – Determination of calorific value. BS EN 15400: Solid recovered fuels - Determination of calorific value	1MJ/kg	UKAS (except Coal)
DETSC 5008	Calorific Value of Soil	A known amount of sample material is burnt in a combustion bomb that is immersed in water in a calorimeter and the difference in the water temperature before and after ignition measured. The calorific value of the sample material is calculated making any necessary corrections for heat generation not associated with the combusting sample. A gelatine capsule will be required to assist combustion which is also corrected for in the final calculations.	BS 1016-105 1992. ISO 19208. ASTM 5865	1MJ/kg	UKAS
DETSC 5009	Sample Preparation of Solid Biomass & Solid Recovered Fuels	If analysis is required on the original material (i.e. Bulk Density) a sub-sample will be taken after initial mixing after which the sample is then reduced by cutting/chopping oversized pieces of material. The material is then mixed and subdivided by manual means during which process representative samples are taken for analysis i.e. total moisture. The remainder of the sample is dried and then reduced to <1mm and again mixed and subdivided to produce the sample for laboratory analysis.	BS EN 14780:2011. BS EN 15413:2011	n/a	Not Accredited
DETSC 5011	Calculation of Fixed Carbon Content of Coal, SRF and Solid Biomass Fuels	The total moisture, analysis moisture, ash and volatile matter content are determined by approved methods. The values obtained are deducted from 100 and this gives the fixed carbon value of the fuel.	DD CENT/S 15296:2006. BS 1016.100:1994. BS ISO 17246:2005	0.10%	Not Accredited
DETSC 5012	Determination of Biomass Content of SRF	A portion of the sample is mixed with sulphuric acid and allowed to stand for at least 16 hours. Hydrogen peroxide is then added, and the sample is left for an additional 5 hours. At the end of this period the unreacted acid and peroxide are diluted down with deionised water. The residue is filtered off using a glass fibre filter and washed with deionised water to remove any remaining acid or peroxide. The filter and residue are placed in a pre-weighed crucible and dried at 1050C. The filter is re-weighed after drying and the non-biomass residue determined. A correction for carbonate content is made by determining the ash content of the original sample. By performing a calorific value on the solid captured on the filter paper, the result can also be expressed as a percentage.	BS EN 15440 Solid recovered fuels - Methods for the determination of biomass content	n/a	UKAS
DETSC 5013	Determination Of Carbon, Hydrogen, Nitrogen & Oxygen In Solid Biomass, Solid Recovered Fuels & Coal	A known mass of sample is introduced into a high temperature combustion reactor and burnt in a stream of pure oxygen. The sample is broken down into its elemental components N2, CO2, and H2O. High performance copper wires absorb the excess oxygen not used for sample combustion. The gases are separated and analysed by infrared or thermal conductivity detectors, dependent on the instrument used. The oxygen content of the sample is determined by calculation from the results obtained for carbon, hydrogen and nitrogen.	BS EN 15104:2011 Solid biofuels - Determination of total content of carbon, hydrogen and nitrogen - Instrumental methods. BS EN 15407:2011 Solid recovered fuels - Methods for the determination of carbon (C), hydrogen (H) and nitrogen(N) content. BS EN 15296:2011 Solid biofuels - Conversion of analytical results from one basis to another	Carbon 0.10%, Nitrogen 0.30%, Hydrogen 0.30%, Oxygen 3.55%	UKAS (except Coal)
DETSC 5014	Metals in Coal, SRF and Biomass by ICP	Metals in coal, solid recovered fuel (SRF) and biomass samples are extracted by microwave using Hydrogen Peroxide (to oxidise and break down organic matter) and Aqua Regia (to dissolve the matrix and hold the metals in solution). Their concentrations are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES).	BS EN 15410 - Solid recovered fuels - Methods for the determination of the content of major elements (Al, Ca, Fe, K, Mg, Na, P, Si, Ti). BS EN 15411 - Solid recovered fuels - Methods for the determination of the content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Ti, V and Zn). BS EN 15290 - Solid biofuels - Determination of major elements - Al, Ca, Fe, Mg, P, K, Si, Na and Ti. BS EN 15297 - Solid biofuels - Determination of minor elements - As, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, V and Zn	0.1 mg/kg: As, Be, Cd, Co, Mn, Ni, P, Pb, Sb, Se, Sn, Ti, V, Zn 0.2mg/kg: Cr, Cu, Ti 0.5mg/kg: Mo 1mg/kg: Al, Fe, K, Mg 5mg/kg: Ca 10mg/kg: Ag, Ba, Rh, Sr, Te	UKAS (except Coal): Al, As (SRF only), Ca, Cd, Co, Cr, Cu, K, Mg, Mn, Na (SRF only), Ni, P, Pb, Se, Sn, Ti, V, Zn All other metals not accredited
DETSC 5015	Mercury in Coal, SRF and Biomass by Atomic Fluorescence Spectroscopy	The mercury is extracted from coal, SRF and biomass in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment of the resulting solution with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is then quantitatively detected using atomic fluorescence spectrometry.	PSA Method – Millennium Merlin Method for Mercury in Sludge, Soils and Sediments.	0.055mg/kg	UKAS (except Coal)
DETSC 5016	Total Sulphur Content Of Coal, SRF And Biomass	Sulphur compounds in SRF and biomass are extracted using aqua regia / hydrogen peroxide and the insoluble residue is removed by filtration. The concentration of sulphur in the filtrate is determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). Loss of sulphur as H2S is prevented by oxidation of the sulphur compounds to sulphate by the aqua regia. The use of hydrogen peroxide enhances the oxidation properties of nitric acid especially in the digestion of organics. Sulphur compounds in coal are determined by ICP-OES from the aqueous washings of the combustion products after firing in a bomb calorimeter.	TRL Report TRL447 (Updated) - Sulphate specification for structural backfills 2005	0.001mg/kg	UKAS (Except Coal)

DETS 5017	Sulphur, Chlorine, Fluorine & Bromine Content of Solid Biomass, Solid Recovered Fuels and Coal by IC	A known weight of fuel is burnt in a pressurised bomb in pure oxygen. After firing of the bomb, it is stood for a minimum of five minutes to allow the combustion products to settle then the oxygen is slowly released over a period of at least three minutes. The bomb is then taken apart and the bomb electrodes rinsed with deionised water into the inside of the bomb. These washings are then decanted into a 50ml volumetric flask. The inside of the bomb is rinsed with deionised water and the washings added to those in the volumetric flask. The contents of the volumetric flask are made up to volume with deionised water and stored for the analysis of sulphur, chloride, fluoride and bromide by ion chromatography.	Operating Instruction Manual No. 442M 6200 Parr Oxygen Bomb Calorimeter. Operating Instruction Manual No. 205M 1108 Oxygen Combustion Bomb. Operating Instruction Manual No. 454M 6510 Water Handling System	0.01% Chlorine, 0.01% Fluorine, 0.01% Bromine, 0.04% Sulphur (Coal only)	UKAS (Except Coal and Br)
DETS 5018	XRF Analysis of Coal, Biomass, SRF and Cement	When X-rays are targeted at a material they will cause electrons to be ejected from the component atoms (ionisation). The ejection of electrons will cause the electronic structure of the component atoms to become unstable resulting in electrons from the higher energy outer orbitals "falling" into the inner orbitals to compensate. This causes a release of energy in the form of a photon equal to the energy difference between the two orbitals involved. Thus the material emits radiation which has energy characteristics of the atoms present. In energy dispersive X-ray fluorescence the fluorescent X-rays emitted are directed to a detector from which the data is processed by a multichannel analyser, producing a digital spectrum which is processed to obtain analytical data. The instrumental analytical parameters are set up for the matrix type. A sample cell is prepared by placing a piece of prolene film over the outer cell and then inserting the inner cell. This gives a complete cell with a clear prolene base. A portion of the sample is placed into the cell and then analysed.	Rigaku NEX CG EDXRF instruction manual	Cement: 0.01% BaO, Cr ₂ O ₃ , CuO, PbO, Rb ₂ O, SrO, ZnO 0.02% Cl, V ₂ O ₅ 0.05% TiO ₂ 0.1% Mn ₂ O ₇ , P ₂ O ₅ , SO ₃ 0.5% K ₂ O 1% Al ₂ O ₃ , CaO, CdO, Co ₂ O ₃ , Fe ₂ O ₃ , MgO, Na ₂ O, NiO, SiO ₂ , Y ₂ O ₃ Fuel: 0.01% Co, Cr, Cu, I, Li, Mn, Ni, P, Pb, Sn, Ti, V, Zn 0.02% Al, Ba, S, Si 0.1% Mg 0.2% Ca 0.5% As, Cd, Hg, Mo, Na, Sb, Se, Th, Tl 1% Ag	Not Accredited
DETS 5019	Determination of Biodegradable Municipal Waste Content (Compositional Analysis)	The method is based on handpicking the BMW fraction from the municipal waste sample, and then weighing the amount of BMW sorted and expressing this as a percentage on a wet weight basis of the weight of the whole municipal waste sample.	ENVIRONMENT AGENCY: Guidance on monitoring of MBT and other treatment processes for the landfill allowances schemes (LATS and LAS) for England and Wales	n/a	Not Accredited
DETS 5020	Determination of Bulk Density in Solid Biomass and Solid Recovered Fuels	The test portion is filled into a standard container of a given size and shape and weighed afterwards. Bulk density is calculated from the net weight per standard volume and reported for the moisture content.	BS EN 15103:2009 Solid Biofuels- Determination of bulk density DD CEN/TS 15401:2010 Solid Recovered Fuels- Determination of bulk density	0.5kg/m ³	Not Accredited
DETS 5021	Auto Ignition Temperature	A quantity of the sample is placed into a metal tray or crucible and placed into an oven or furnace. The temperature of the oven / furnace is increased in predefined increments and the temperature in which the sample ignites is noted.	None	25°C	Not Accredited
DETS 5022	LOI Content of Fines	The sample is dried to constant weight and its particle size reduced to <2mm. The LOI content of the sample is then determined gravimetrically. A known weight of the prepared sample is placed in a crucible and placed in a furnace. The furnace is heated to set temperature and following combustion the crucible and sample are removed, cooled and reweighed.	The Landfill Tax (Qualifying Material) Order 2011	0.10%	Not Accredited
DETS 5023	Crude Fibre	The sample after defatting is sequentially treated with boiling dilute sulphuric acid, and with boiling potassium hydroxide solution. The loss in mass resulting from incineration corresponds to the mass of crude fibre.	FAO - Quality Assurance for Animal Feed Analysis Laboratories – Part II Analysis Section	1%	Not Accredited
DETS 5024	Void Space	Water is added to a known volume of biofilter media until it fills all the void spaces and percentage voids is calculated.	https://www.sdstate.edu/abe/faculty/upload/Determining-Pressure-Drop-through-Compost-No-014080.pdf	0.1%	Not Accredited
DETS 5025	Theoretical Biogas Potential	The Baserga equation determines how much biogas a feedstock may theoretically produce based on nutrient content.	An Analysis of Available Mathematical Models for Anaerobic Digestion of Organic Substances for Production of Biogas. Mandy Gerber, Chair of Thermodynamics, Germany, International Gas Union Research Conference, 2008. Biogas: Calculation of Gas Yield of co-substrates	0.1% Total Methane 1m ³ /tonne Yield	Not Accredited
DETS 5026	Determination of Particle Size Distribution	A sample is subjected to sieving through horizontally oscillating sieves, sorting the particles in decreasing size classes either manually or by machine sieving. For particles less than 25mm, only machine sieving is used, for particles greater than 25mm, manual or machine sieving is applied.	BS EN 15415-1 – Solid recovered fuels - Determination of particle size distribution BS EN 15149-2 – Solid biofuels - Determination of particle size distribution	n/a	Not Accredited

DETSC 5027	Flammability Potential Screening Analysis	<p>The method is split into three parts which can be ran independently of each other:</p> <ul style="list-style-type: none"> • exposure to heat and flame • exposure to a spark source • exposure to heat and a spark source (flash point) <p>Exposure to heat and flame: the as-received sample is exposed to heat and flame. Observations are used to report if the sample has a negative or positive flammability potential.</p> <p>Exposure to a spark source: the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and observations made to report if the sample has a negative or positive flammability potential.</p> <p>Exposure to heat and a spark source (flash point): the as-received sample is placed into a beaker with a watchglass placed on top. Sparks are introduced to the vapour space above the sample and if the sample flashes, the temperature is reported. The analysis is repeated at 5°C intervals until the vapour flashes or the temperature of 100°C is reached.</p>	ASTM D4982-12: Standard Test method for Flammability Potential Screening Analysis of Waste	n/a	Not Accredited
DETSC 5028	Determination of Length and Diameter of Pellets	<p>The length and diameter of fuel pellets of a representative sample of fuel pellets are measured by using a calliper. The length of a pellet is always measured along the axis of the cylinder. The diameter is measured perpendicular to the axis.</p>	BS EN 16127 – Solid biofuels - Determination of length and diameter of pellets	n/a	Not Accredited

A66 Northern Trans-Pennine

**Ground Investigation Report
Package D Bowes Bypass and
Cross Lanes to Rokeby**

GDMS No.33006

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1 Introduction

1.1 Scope and Objectives of the Report

- 1.1.1 As part of the Roads Investment Strategy 2, the United Kingdom Government Department for Transport has provided funding to further develop the business case for dualling the remaining single carriageway sections of the A66 and making other improvements along its length. National Highways (formerly Highways England) is responsible for development of this scheme, subsequently referred to as the A66 Northern Trans-Pennine Project (A66-NTP).
- 1.1.2 National Highways are progressing the project in accordance with their Project Control Framework (PCF) and appointed an Amey Arup Joint Venture (Amey/Arup) to progress the project through PCF Stage 3.
- 1.1.3 A key deliverable for PCF Stage 3 is a Ground Investigation Report (GIR). Requirements for its contents are given in CD622 Managing Geotechnical Risk [1].
- 1.1.4 The GIR reports on part of the geotechnical design process as set out in Eurocode 7 [2][3][4][5]. It forms part of the Geotechnical Design Report (GDR) and in particular reports on the results of the geotechnical investigation. The geotechnical investigation commenced with the Statement of Intent (SOI) and the Preliminary Sources Study Report (PSSR) defined in CD622 [1], followed by the Ground Investigation Scoping Reports (GISR). This report, the GIR, makes reference to the PSSR [6].

1.2 Brief Discussion of the Project

- 1.2.1 The preferred route alignment for the project is defined in a National Highways publication dated Spring 2020, entitled A66 Northern Trans-Pennine Project Preferred Route Announcement [9]. Some relevant content from this publication is given below to provide background and context to this current report.
- 1.2.2 National Highways has been commissioned by the Department for Transport (DfT) to investigate the potential to improve the A66 between M6 junction 40 at Penrith and the A1(M) at Scotch Corner, which is a corridor of 50 miles. This is in order to address the lack of east/west connectivity across the Pennines in the north of England.
- 1.2.3 The project is defined as a Nationally Significant Infrastructure Project in terms of the Planning Act 2008. Consequently, a Development Consent Order (DCO) will be required to proceed to construction.
- 1.2.4 Figure 1 below provides an overview of the whole route corridor. Within this, several separate packages (A, B, C and D) are being developed by Amey/Arup. Together, these package proposals will provide the basis for the DCO submission. The GIR for each package is a required deliverable for the DCO application.
- 1.2.5 This particular GIR is focussed on package D, which is further divided into schemes 7 (Bowes Bypass) and 8 (Cross Lanes to Rokeby). The proposed alignments have been developed from the route options presented within the PSSR [6] following design development and external consultation during PCF Stage 3. Despite changes to the proposed route alignment, the PSSR is still considered to be relevant. Where necessary, the PSSR information has been supplemented in chapter 2 of this report.
- 1.2.6 This GIR is based on design freeze E, however; site works were specified and executed based on design freeze C/D. Where subsequent alignment changes were developed, the existing ground investigation has been used to the extent that it is relevant, however future targeted ground investigation will be required in areas not fully covered by this report.
- 1.2.7 Package D extends from Bowes in the west to Rokeby, some 9km to the east. For development, this report structure is matched to those on a scheme by scheme basis. Drawings showing the proposed alignments of schemes 7 and 8 are provided in Appendix A.

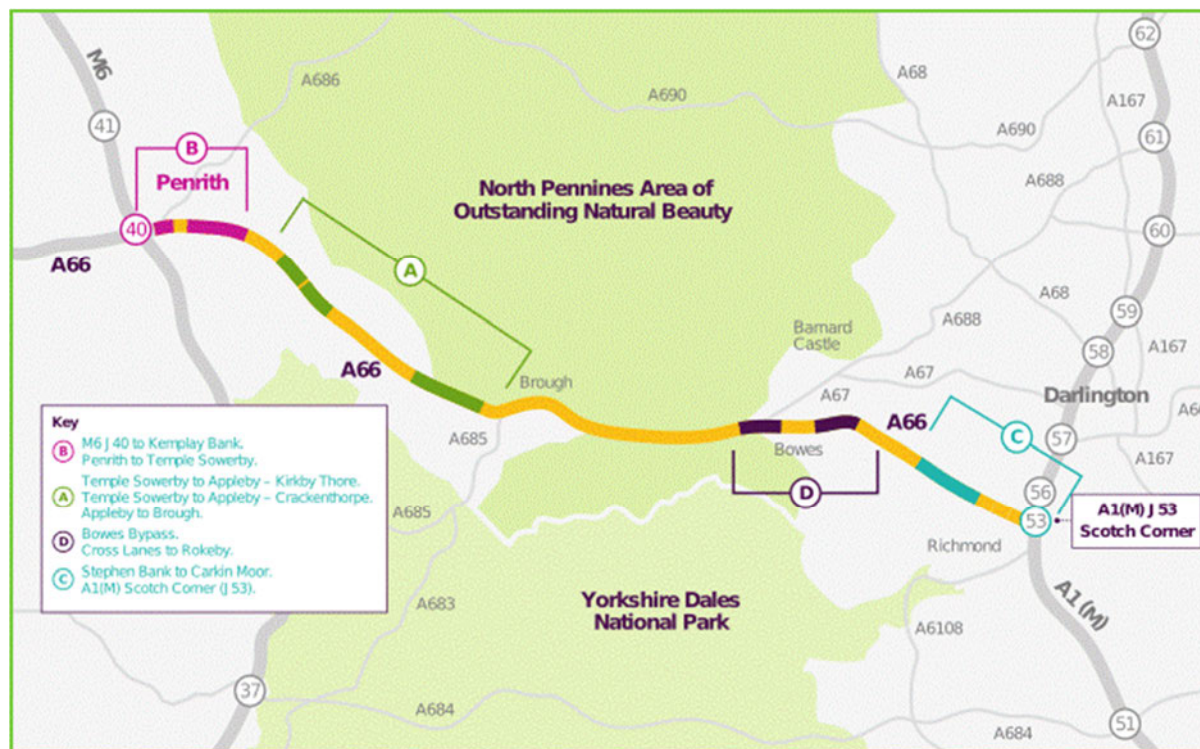


Figure 1: A66 Northern Trans-Pennine Corridor and Packages

- 1.2.8 Scheme 7 of the proposed alignment will closely follow the existing A66 to the north of the village of Bowes, with a new adjacent eastbound carriageway to the north. A replacement overbridge is proposed at Clint Lane. At the junction with the A67, an underbridge will carry the new eastbound carriageway and new slip roads will accommodate traffic travelling to and from the A67 and Bowes. The route will continue in a south-east direction and a new accommodation overpass will be constructed at East Bowes to ensure nearby farms have continued access across the A66.
- 1.2.9 Scheme 8 of the proposed alignment will mostly follow the existing A66 alignment. A link road will be constructed linking Rutherford Lane and the B6277 Moorhouse Lane with the existing junction at Cross Lanes upgraded to a compact grade separated junction where the new link road crosses over the A66. A new adjacent westbound carriageway will be constructed to the south between the B6277 junction at Cross Lanes and the existing Tutta Beck Cottage access and both carriageways will then be diverted to the south of The Old Rectory and St Mary's Church, re-joining the existing A66 at Rokeby. A new compact grade separated junction will be constructed to the west of The Old Rectory and St Mary's Church in an underpass to maintain the existing connectivity between the A66 and the local road known as Barnard Castle Road, which provides HGV access to Barnard Castle. The existing A66 will be de-trunked from the new junction to where it meets Barnard Castle Road. The eastbound merge from Barnard Castle Road onto the A66 will be maintained in its current location. This route is referred to as the black route.
- 1.2.10 A second option is also being considered, known as the blue route, however this is currently not supported by the project team due to conflicts with national planning policy relating to its potential impact on the Registered Park and Garden, which it would bisect. The blue route will mostly follow the existing A66 alignment, replicating the alignment in the black route. As per the black route a link road will be constructed linking Rutherford Lane and the B6277 Moorhouse Lane with the existing junction at Cross Lanes upgraded to a compact grade separated junction where the new link road crosses over the A66. A new adjacent westbound carriageway will be constructed to the south between the B6277 junction at Cross Lanes and the existing Tutta Beck Cottage access and both carriageways will then be diverted to the

south of The Old Rectory and St Mary's Church, re-joining the existing A66 at Rokeby. Different to the black route a new junction will be constructed to the east of The Old Rectory and St Mary's Church as an underpass beneath the Registered Park and Garden to maintain current connectivity between the A66 and Barnard Castle Road. The existing A66 will be de-trunked west of St Mary's Church to the local road known as Barnard Castle Road.

1.3 Geotechnical Category

- 1.3.1 Management of ground risks (geotechnical risks) to the project is undertaken in accordance with Design Manual for Roads and Bridges (DMRB) document CD622 [1]. This document incorporates the requirements of Eurocode 7 (EC7). EC7 is a convenient reference for the underlying British Standard Euronorms BSEN1997:1 [2] and BSEN1997:2 [3] and their United Kingdom National Annexes [4][5].
- 1.3.2 Design in accordance with EC7 requires assignment of a geotechnical category to the elements within the project and defines categories 1 to 3.
- 1.3.3 At this point, all 'geotechnical structures' (earthworks and structures) are expected to fall into Geotechnical Category 2. EC7 provides the following:
- Geotechnical Category 2 should include conventional types of structure and foundation with no exceptional risk or difficult or loading conditions.
 - Designs for structures in Geotechnical Category 2 should normally include quantitative geotechnical data and analysis to ensure that the fundamental requirements are satisfied.
 - Routine procedures for field and laboratory testing and for design and execution may be used for Geotechnical Category 2 designs.
- 1.3.4 The geotechnical category of each individual geotechnical structure is considered in chapters 4 and 6, and will be confirmed in chapter 10 (Engineering Assessment). If a feature requires re-categorization to the higher Category 3, then that will be highlighted. For Category 3 elements, further investigation and/or monitoring requirements (during and post construction) will need to be considered.
- 1.3.5 Geotechnical Certification requirements are set out in CD622 [1] and those applicable to Category 2 are therefore applicable at this stage of development.
- 1.3.6 Following development permission under planning rules, the National Highways PCF will provide the means to appoint contractors for construction of the schemes. These contractors will engage their own designers who will take responsibility for development of the geotechnical design and to present relevant Geotechnical Design Reports to that effect. These designers may re-define the Geotechnical Category of particular structures and will define any further investigation or testing deemed necessary to satisfy EC7, before proceeding to undertake detailed design.
- 1.3.7 Where particular complexity leads to classification of Category 3 geotechnical structures, more demanding certification requirements set out in CD622 [1] will apply to the design process.

1.4 Other Relevant Information

- 1.4.1 The Preliminary Sources Study Report (PSSR) was developed on behalf of National Highways [6] and this is fully considered in chapter 2 (Existing Information).

1.5 Structure of Report

- 1.5.1 This particular report presents the Ground Investigation Report (GIR) for package D as described above.
- 1.5.2 The ground summary for package D is developed on a scheme by scheme basis, each with discussion of its corresponding geo-environmental model immediately following the ground summary:

- Scheme 7: Bowes Bypass – Ground Summary (chapter 4)
- Scheme 7: Bowes Bypass – Geo-Environmental Model (chapter 5)
- Scheme 8: Cross Lanes to Rokeby – Ground Summary (chapter 6)
- Scheme 8: Cross Lanes to Rokeby – Geo-Environmental Model (chapter 7)

1.5.3 The following information is contained in Appendices:

- Appendix A: Drawings
- Appendix B: Methodology for Derivation of Parameters
- Appendix C: List of Locations
- Appendix D: Plots of Laboratory and In-situ Testing
- Appendix E: Geo-Environmental Testing Suites
- Appendix F: Geo-Environmental Risk Assessment Methodology
- Appendix G: Waste Hazard Assessment Methodology
- Appendix I: Waste Hazard Assessment Certificates
- Appendix J: Ground Investigation Factual Report

1.6 Report Limitations

1.6.1 This is a report on the Preliminary Ground Investigation to fulfil the objectives of PCF Stage 3.

2 Existing Information

2.1 Areas Previously Covered in the PSSR

- 2.1.1 A review of existing information is contained in the PSSR [6] and is not repeated here. Only additional information that has been obtained during PCF Stage 3 is presented in Table 2.1-1.
- 2.1.2 The PSSR considered a number of route options and presented those in Table 1-1 therein. At that time, the route options were grouped by “Section”. The sections in the PSSR that are relevant to Package D are:
- Section 10: Bowes Bypass
 - Section 12: Cross Lanes to Greta Bridge
- 2.1.3 The route options covered by the PSSR have been subsequently developed. Consequently, references in this GIR will now use the scheme names explained in Chapter 1 above.
- 2.1.4 The current proposed alignment of Cross Lanes Junction was introduced during design freeze E. As such this falls outside the area covered by the PSSR [6]. This is discussed in detail under sub-heading 2.2.

Table 2.1-1: Summary of Additional Sources of Information Used During PCF Stage 3

Source	Detail
Topographical maps	A merged surface was created from Aerial LiDAR, OS Maps and Digital Terrain Data (5m) obtained from National Highways’ GeoStore [10] at the beginning of the design stage.
Geological maps and memoirs	British Geological Survey (BGS) solid and drift maps to 1:50,000 scale [11] have been accessed across the scheme. The British Geological Survey Lexicon of Named Rock Units [12] and the British Geological Survey Geoindex [13] were accessed in 2020 and 2021. The BGS National Karst Database which shows cave and karst features has also been used [14].
Aerial photographs / drone surveys	Opensource data sources of Google Earth Pro, Bing Maps and those on FuseMap have been used.
Records of mining, mineral deposits, caves and karst	The Coal Authority Viewer [15] was accessed in 2021 to view information on past and current recorded coal mining activities, at surface (opencast) and at depth (underground). Detailed overviews of caves and surface karst features in the North Pennines by caving and potholing societies have been utilised where relevant. Notably, The Caves and Karst of the Yorkshire Dales (Volume 2 The Caves) (Waltham and Lowe (eds.) 2017) has been used, which includes a section on the Caves of the North Pennines (Ryder P. and Harrison T.) [16]. A karst desk study and risk assessment [17] has been produced with further details. This will be included as an Appendix of the ES Road Drainage and Water Environment chapter.
Land use and soil survey information	Various geodiversity information sources were accessed such as the Defra Multi-Agency Geographic Information for the Countryside (MAGIC) website [18] and Cumbria geo-conservation interactive mapping [19]. Soils information data sources such as various agricultural land classification maps were accessed to classify the land within the schemes. Further information is given in the Geology and Soils chapter of the Preliminary Environmental Information Report (PEIR) [20].

Source	Detail
Archaeological and historical investigations	<p>The 2021 ground investigation took place with an archaeological watching brief, see sub-heading 3.8 of this report for details.</p> <p>Geophysical surveys were undertaken in 2020 across all packages on agricultural land to assess the impact of the proposed upgrades on the historic environment [21]. A second phase was underway at the time of writing to fill in gaps that resulted from limitations on land access and the intervening design development.</p> <p>A remote sensing report and an archaeological trenching investigation were also being carried out at the time of writing and the outcome of these will be reported in the Environmental Statement (ES).</p>
GPR/ Utilities	<p>The ground investigation contractor undertook a review of utility plans, localised GPR surveys and CAT scanning of exploratory hole locations before proceeding.</p> <p>A site wide GPR survey was not undertaken during this stage of design.</p>
Consultation with Statutory Bodies and Agencies	<p>The following project stakeholders have been consulted: National Highways; National Highways Area 14 Asset Delivery team; National Highways Safety, Engineering and Standards (SES) Structures Advisors; Durham County Council (inc. Highways, PROW); Environment Agency and Natural England; Sir Robert McAlpine (SRM) – A66 NTP PCF 3 ECI Contractor; Statutory undertakers; and local businesses, landowners and residents. More specific detail is given in the Structural Options Reports [22][23][24][25][26][27][28].</p>
Flood records	<p>The flood risk maps were reviewed [29] and flood modelling has been carried out by Amey/Arup to establish baseline flood extents.</p>
Contaminated land	<p>Contamination information sources used not noted elsewhere in this table include: current and historical landfill sites; licensed waste management sites; current and historical industrial or commercial sites, discharges to surface water, foot and mouth disease burial sites; and farmyards.</p> <p>Stakeholder engagement was also carried out with County and District Councils, mines, the Environment Agency, Defra, National Farmers Union and the Ministry of Defence.</p> <p>Further information is given in the PEIR [20] and in chapters 5 and 7 of this report.</p>

2.2 Scheme 8 – Pounder Gill to Cross Lanes

2.2.1 The Cross Lanes Junction proposals at the western extent of scheme 8 are located between Pounder Gill (Rutherford Lane) and the existing access junction to Cross Lanes Farm. This alignment was introduced during design freeze E. For this area, a high-level desk study review of information held on National Highways Geotechnical Data Management System (GDMS) and other public sources of freely available information has been undertaken and is summarised in Table 2.2-1 below.

Table 2.2-1: Sources of Information for Area between Pounder Gill and Cross Lanes

Source	Scheme 8 Pounder Gill to Cross Lanes
Topographical maps	<p>Current topographical mapping [30] indicates the A66 to be dualled in this area of the site, with ground levels sloping gently to the southeast. Tutta Beck is shown approximately 100m south of the A66 and flows from west to east.</p> <p>The available historical maps (on GDMS) indicate the area is predominantly undeveloped and in agricultural use, with a road along the existing alignment of the A66 present from the earliest historical mapping from 1893.</p>
Geological maps and memoirs	<p>The 1:50,000 [11] geological mapping indicates ground conditions in the area of Cross Lanes Junction to be consistent with the rest of the scheme 8 area. The superficial geology is shown as Glacial, and bedrock deposits as the Great Limestone Member (Limestone), Alston Group and Four Fathoms Limestone.</p>

Source	Scheme 8 Pounder Gill to Cross Lanes
	The superficial geology and location of historical boreholes is provided below showing most of the site to comprise Glacial with Alluvium shown to the south of the site.
Aerial photographs / drone surveys	Aerial imagery has been viewed through Google Earth Pro [30]. The earliest imagery from 1945 shows the A66 as a single carriageway, and Cross Lanes farm shop to be absent. Imagery from 2001 shows the A66 in its current configuration, with Cross Lanes farm present immediately south of the A66. Cross Lanes farm is shown to expand between 2001 to present day. Field boundaries appear to have remained consistent within the area of the proposed junction.
Records of mines and mineral deposits	The area is not within a Coal Mining Reporting Area [31]. No non-coal mining is known and no other mineral deposits are expected to have been mined. A disused limestone quarry is shown approximately 500m west of the scheme proposals on historical mapping.
Land use and soil survey information	A review of the available OS mapping indicates the area is predominantly in use for agricultural purposes. Dent House Farm is located approximately 150m south of the proposed junction. The Cranfield Soil and Agrifood Institute mapping [32] indicates the area to comprise freely draining slightly acidic loamy soils of low fertility.
Archaeological and historical investigations	GDMS [33] was reviewed to understand if the site included any site with a Statutory Designation. No statutory designations were shown.
Existing ground investigations	Ten historical exploratory hole logs available on GDMS [33] and the BGS online dataviewer [13] have been reviewed, the locations of which are provided on Figure 2. These comprise NZ01SW41 to NZ01SW49 and NZ01SW60/A. The holes range between 3.3 and 6m depth and were undertaken in 1975 through cable percussive techniques. The exploratory holes encountered a thin layer of topsoil and subsoil, generally 0.3m thick, overlying thin loam or sandy and silty clays with variable gravel content. Boulders were noted within most holes below approximately 1.5m bgl. Topsoil with tarmac, rubble and chippings were recorded within NZ01SW60/A. A boulder or possible bedrock was encountered at 4.8m bgl within NZ01SW41.
Consultation with Statutory Bodies and Agencies	Consultations with Durham County Council, Community Liaison Groups and landowners have been undertaken for this additional area.
Earthworks	A summary of the earthworks present within the proposed Cross Lanes Junction area, and any defects identified in GDMS, is provided in Table 2.2-2.
Flood records	The flood risk map indicates the area surrounding Tutta Beck and the unnamed tributary to the north to be at risk of surface water flooding [29].
Contaminated land	A review of historical maps has not identified any significant sources of contamination within the development footprint. A smithy was formerly present in the north of the proposed junction area, shown on the earliest available mapping but no longer shown on mapping from 1975. Rutherford Lane is shown on the existing alignment from the earliest mapping.
Other relevant information	The BGS Geosure dataset [14] indicates the area to be at significant risk of soluble rocks. A desktop study on potential karst features [17] indicates that no karst landforms have been identified within the scheme 8 study area, and provides recommendations for further targeted ground investigation to be undertaken.



Figure 2: Pounder Gill to Cross Lanes Borehole Locations and Superficial Geology [11].

Table 2.2-2: GDMS Existing Defects Along Area Between Pounder Gill and Cross Lanes

Earthwork ID	Defect Reference Number	Comment
Eastbound		
31331 Embankment		No Defects Recorded
31332 Embankment		No Defects Recorded
31333 Embankment		No Defects Recorded
31334 At Grade		No Defects Recorded
31353 At Grade		No Defects Recorded
Westbound		
31270 At Grade		No Defects Recorded
31279 Embankment	19915	Settlement of slope due to burrows
	30905	Burrows in verge and around crest of slope. Slope collapsing underfoot from burrows
31280 At Grade	21191	Subsidence - Sign base undermined.
	105279	Unbackfilled Excavation. Retaining wall. Hole in verge at W end
63017 At Grade		No Defects Recorded

3 Field and Laboratory Studies

3.1 Geomorphological/Geological Mapping and Topographic Survey

3.1.1 A formal site walkover of the whole route was not undertaken, however a walkover of selected pertinent geo-environmental locations was undertaken on 22 and 25 January 2021. Locations visited along package D are listed below:

- **Former Bowes Station (Rail) NGR: 399625,513840** – former railway station, platform and associated buildings in poor condition, evidence of underground utilities and potential for contamination associated with former railway.
- **Cross Lanes Farm Shop NGR: 405039,513764** – farm shop with storage area including building materials and plastic barrels of unknown contents.

3.1.2 The site was also visited in October 2020 to inspect potential collapse and dissolution landforms previously mapped in the project study area. The observations made are reported in the desktop study on potential karst features [17] with no karst landforms identified within the schemes in Package D.

3.1.3 Detailed topographical surveys have been commissioned as part of the project, but no information was available at the time of writing.

3.1.4 No new geomorphological or geological mapping has been conducted as part of the ground investigation work relating to this report.

3.2 Ground Investigations

3.2.1 A review of historical ground investigation information was undertaken and reported in the PSSR [6]. A preliminary ground investigation was designed by Amey/Arup to verify and supplement information collated in Stage 2 and to develop an appropriate strategy to inform preliminary design for PCF Stage 3. The scope of the ground investigation was defined in the Specification for Ground Investigation [34]. The investigation was tailored to provide reasonably comprehensive geotechnical information to address the principal geotechnical risks identified at Stage 2 and provide sufficient detail to inform general scheme wide ground conditions in terms of geological profiles, groundwater regime, depth to bedrock, potential contaminants, and suitability of excavated material for re-use.

3.2.2 The purpose of the investigation was to ascertain:

- The geological sequence;
- Groundwater levels across the development area;
- Permeability of the underlying soil horizons and bedrock strata at the proposed location of attenuation ponds;
- Undertake in-situ geotechnical testing;
- Obtain soil and rock samples to permit geotechnical and geo-environmental laboratory testing;
- Enable an initial assessment of sulphate content in soils to inform soil treatment options; and
- Collate appropriate levels of information to inform Preliminary Design.

3.2.3 It should be noted the ground investigation was scoped based on design freeze C with some locations revised during site works based on design freeze D information. Where subsequent alignment changes were developed, future targeted ground investigation will be required in areas not fully covered by this report.

3.2.4 The ground investigation site works were carried out between 1 February and 10 March 2021 by Allied Exploration Geotechnics Ltd (AEG Ltd.).

3.3 Description of Fieldwork

3.3.1 The following fieldwork was conducted by AEG Ltd. during the 2021 ground investigation.

Table 3.3-1: Works Undertaken during 2021 Ground Investigation

Type	Number (Scheme 7)	Number (Scheme 8)	Total Number	Depth range (m bgl)
Exploratory Hole Locations				
Cable percussion borehole	12	4	16	2-8.5
Cable percussion borehole with rotary follow on	11	3	14	5-20.3
Rotary open hole and rotary core borehole	2	1	3	15-17.0
Windowless sampling borehole	2	3	5	2.4-5.2
Machine-excavated trial pit	14	18	32	0.35-4.5
Hand-dug trial pit	0	0	0	N/A
Surface water groundwater sampling locations	2	2	4	N/A
Groundwater installations in boreholes				
Installation of 50mm standpipe in borehole	3	0	3	4-12
Installation of 19mm standpipe piezometer in borehole	18	5	23	2-15.5
In-situ testing (number of locations)				
Plate load testing	6	7	13	0.35-0.5
Infiltration testing	5	4	9	2
Permeability testing in groundwater installation	9	4	13	2-15.5

3.3.2 Several locations specified were not completed or modified for the reasons described in Table 3.3-2 and Table 3.3-3 below.

Table 3.3-2: Changes in Scope Agreed During the Works

Scheme	Location	Comment
Scheme 7	BH BB001/ WS BB002	BH BB001 not completed as terrain unsuitable for borehole. Additional window sampling hole completed nearby as WS BB002.
Scheme 7	TP BB003/ HDP001	Shallow bedrock encountered in TP BB003. Additional hand dug inspection pit completed nearby as HDP001.

Table 3.3-3: Omissions from Original Specification

Scheme	Location	Comment
Scheme	BH CLR006	No longer required due to scheme layout changes.
Scheme 8	BH CLR007	Not completed, land access not granted.
Scheme 8	BH CLR008	Not completed, land access not granted.
Scheme 8	BH CLR009	Not completed, land access not granted.
Scheme 8	BH CLR010/ BH CLR011/ WS CLR001	Well development not carried out due to land access.
Scheme 8	WS CLR002	Not completed, land access not granted.
Scheme 8	WS CLR004	Not completed, land access not granted.
Scheme 8	WS CLR006	No longer required due to scheme layout changes.
Scheme 8	TP CLR014	Not completed, land access not granted.
Scheme 8	TP CLR016	Not completed, land access not granted.
Scheme 8	TP CLR017	Not completed, land access not granted.
Scheme 8	TP CLR018	Not completed, land access not granted.
Scheme 8	TP CLR019	Not completed, land access not granted.
Scheme 8	TP CLR021	Not completed, land access not granted.
Scheme 8	TP CLR022	Not completed, land access not granted.

3.4 Results of In-situ Tests

- 3.4.1 Standard Penetration Tests (SPT) were undertaken within all boreholes and windowless sample holes.
- 3.4.2 Hand shear vanes were undertaken where practical within the cohesive material encountered in each of the hand excavated inspection pits.
- 3.4.3 Plate load tests were undertaken within selected trial pit locations in accordance with BS1377 [35].
- 3.4.4 Infiltration rate tests were undertaken within nine pits in accordance with BRE Digest 365 Soakaway Design [36] at locations close to proposed attenuation ponds.
- 3.4.5 Falling/raising head permeability tests [35] were undertaken in selected boreholes.
- 3.4.6 The results of the in-situ testing are presented in the 2021 AEG Factual Reports [37] [38] in Appendix J and are discussed in chapters 4 and 6 of this report.

3.5 Drainage Studies

- 3.5.1 No drainage studies have been completed as part of the 2021 investigation, although some infiltration testing was done to assess the soakaway potential of the near surface soil deposits as noted earlier. Infiltration rates and existing groundwater levels have been determined and these will be available to future drainage designers.
- 3.5.2 For preliminary geotechnical design, the 2021 investigation has indicated the presence of fine soils in some areas. These are discussed further in the later ground summaries, but such materials are known to be susceptible to groundwater and surface water actions. As a result, it is expected that where existing topography falls towards cuttings these will require protection

by crest drainage. Toe of cutting drainage will be provided in accordance with the Specification for Highway Works Clause 500.

3.6 Geophysical Surveys

3.6.1 No geophysical survey was undertaken as part of the 2021 investigation.

3.7 Test Pile Results

3.7.1 No test piling was undertaken as part of the 2021 investigation.

3.7.2 Piling design will be required where structure foundations cannot adopt a shallow foundation type. These aspects will be determined at detailed design stage. At that stage, it is recommended that the requirements of Eurocodes are fully applied and that adequate pile testing is mandated by the design. It is recommended that fully instrumented preliminary piles are constructed and tested at each structure location. These tests are likely to be static, sustained load tests. Further dynamic load tests are recommended to supplement the static testing on an appropriate sample of piles during construction, at the frequency recommended in the Eurocodes.

3.7.3 Construction and testing of preliminary piles for piling solutions is expensive and is often an area where design and build organisations look to minimise cost. Industry experience has shown this to be ill-advised and a suitable mechanism is vital to ensure that suitable testing is in place for any piling proposals. This can typically be accommodated by specific inclusion in the client's requirements.

3.8 Other Field Work

3.8.1 The 2021 ground investigation included an archaeological watching brief by Northern Archaeological Associates Ltd. (NAA) at each trial pit location. The results are contained in the Archaeological Monitoring Report, included with the factual reports from the 2021 ground investigation [37] [38].

3.9 Laboratory Investigation

3.9.1 Laboratory geotechnical and chemical testing was scheduled by Amey/Arup engineers and conducted by AEG Ltd. or subcontracted to other accredited laboratories.

3.10 Description of Tests

3.10.1 Table 3.10-1 provides a summary of the laboratory testing carried out.

Table 3.10-1: Scheduled Laboratory Testing

Test	Number (Scheme 7)	Number (Scheme 8)	Total Number
Geotechnical testing (soil)			
Natural Moisture Content	100	56	156
Atterberg Limits	64	35	99
Bulk Density Determination	5	0	5
Particle Density Determination	24	9	23
Particle Size Distribution	55	28	83
Dry Density/ Moisture Content (4.5kg rammer)	17	8	25
MCV (single-point)	13	1	14
MCC (multi-point MCV/ MC relationship)	16	8	24

Test	Number (Scheme 7)	Number (Scheme 8)	Total Number
One-Dimensional Consolidation Tests	4	1	5
California Bearing Ratio	13	9	22
Consolidated Undrained triaxial with measurement of pore-pressure	2	0	2
Unconsolidated Undrained triaxial without measurement of pore pressure	3	3	6
Hand Shear Vane	3	4	7
Small Shearbox	6	0	6
BRE Chemical Tests	42	11	53
Geotechnical testing (rock)			
Moisture Content	13 (23) ⁽¹⁾	1 (3) ⁽¹⁾	14 (26) ⁽¹⁾
Point Load Strength Index Tests	199	30	229
Unconfined Compressive Strength Tests	10	2	12
Geo-environmental Chemical testing			
Soil	72	35	107
Groundwater	2	1	3
Surface water	2	2	4
⁽¹⁾ In addition to the 14 rock moisture content tests carried out, an additional 12 moisture content determinations were made as part of UCS testing.			

3.11 Factual Report and Data

3.11.1 Factual information from the 2021 ground investigation is contained in the Ground Investigation Factual Reports prepared for each scheme [37] [38]. The test results reported in this document were transmitted to Amey/Arup by AEG Ltd. in AGS format on the 9 and 15 September 2021.

4 Scheme 7: Bowes Bypass – Ground Summary

4.1 Scheme Description

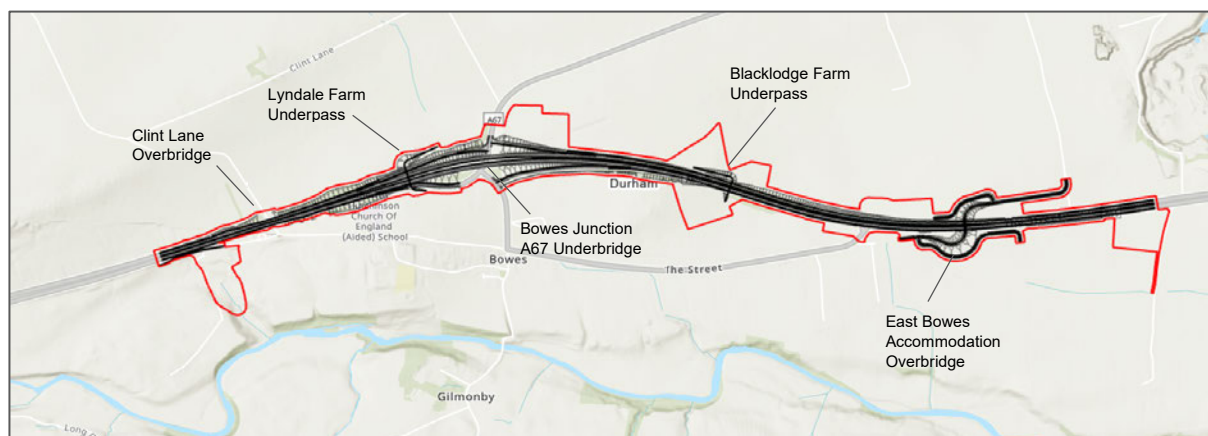


Figure 3: Scheme 7 Route Alignment

- 4.1.1 Scheme 7 covers between chainage Ch. 50+000m and Ch. 52+941m, see Figure 3. Existing ground level at the start of the scheme is 288.00mOD, which falls to 285.20mOD at chainage Ch.50+300m before rising gently to 289.50mOD at chainage Ch. 50+850m. The ground level then falls to 263.90mOD at chainage Ch. 52 +650m, where it then rises gently to 265.00mOD at the end chainage.
- 4.1.2 Scheme 7 is located to the west of the North Pennines Area of Outstanding Natural Beauty (AONB) and will closely follow the existing A66 to the north of the village of Bowes, with a new adjacent eastbound carriageway to the north. A replacement overbridge is proposed at Clint Lane. At the junction with the A67, an underbridge will carry the new eastbound carriageway and new slip roads will accommodate traffic travelling to and from the A67 and Bowes. The route will continue in a south-east direction and a new accommodation overpass will be constructed at East Bowes to ensure nearby farms have continued access across the A66. Refer to drawings HE565627-AMY-HGT-S07-DR-CE-100001-5 in Appendix A for scheme proposals (freeze E), with the positions of relevant exploratory holes.
- 4.1.3 For the purposes of design, scheme 7 is divided into five sections based on the proposed works under the scheme, see Table 4.1-1. The first segment extends from Ch. 50+000m to Ch. 50+750m, immediately north of the AONB, and incorporates the overbridge at Clint Lane and Lyndale Farm underpass. The second segment extends from Ch. 50+750m to Ch. 51+300m incorporating the A67 junction and associated slip roads. The third segment extends from Ch. 51+300m to Ch. 51+700m incorporating the extended Blacklodge Farm underpass. The fourth segment extends from Ch. 51+650m to Ch. 52+941m along the main alignment with the fifth segment limited to Ch.52+200m and Ch. 52+500m focussing on the East Bowes accommodation overpass.
- 4.1.4 The earthworks and structures proposed along scheme 7 are listed in Table 4.1-1 with attenuation ponds listed in Table 4.1-2.

Table 4.1-1: Scheme 7 - Structures and Earthworks

Section	Feature	Description	Chainage start (m)	Chainage end (m)
7.1	Start of scheme to Lyndale Farm underpass		50+000	50+750
	Earthwork 1 – Cutting/ At-grade	Widening of existing alignment, minor modification to existing slope via slackening and cut back. Maximum cutting depth 7m.	50+000	50+700

Section	Feature	Description	Chainage start (m)	Chainage end (m)
	Existing culvert S07-C01 to be retained	Existing 38m long culvert to be retained.	50+220	50+220
	Structure 1 – New gravity retaining wall	New retaining wall along WB carriageway. A retained height of approximately 0.5m is anticipated at the toe of the cutting.	50+225	50+280
	Structure 2 – Clint Lane overbridge replacement	Existing overbridge needs to be replaced. Three options are being considered: 1) replace with a longer bridge on the existing alignment , 2) replace with a longer bridge on an adjacent alignment and 3) replace with a longer NMU bridge on the existing alignment. Preferred solution TBC.	50+330	50+330
	Structure 3 – Existing retaining wall to be retained	Existing retaining wall adjacent to bus stop at WB carriageway to be retained. The wall is located at the toe of the cutting.	50+420	50+470
	Earthwork 2 – Cutting	Cutting slopes up to 7m adjacent to eastbound off-slip for A67 junction to enable extension of Lyndale Farm underpass to the north.	50+700	50+750
	Structure 4 – Lyndale Farm underpass extension	The existing underpass will be extended in length from 35m to 59.6m (22.3m north and 2.3m south).	50+750	50+750
7.2	A67 junction		50+750	51+300
	Earthwork 1 – Embankment	Eastbound embankment of up to 5m for widening main alignment. Localised upfilling required above existing A67 off-slip.	50+750	51+200
	Earthwork 2 – Cutting	Cutting up to 5m deep for eastbound diverge.	50+750	51+000
	Earthwork 3 – Cutting	Nominal earthworks for westbound merge.	50+750	50+900
	Existing culvert S07-C02 to be retained	Existing 55m culvert at Bowes Junction underbridge to be retained.	50+980	50+980
	Structure 1 – New Bowes junction underbridge	New bridge required to carry the eastbound carriageway.	50+980	50+980
	New Culverts S07-C04, S07-C05, S07-C06	Three new 1.5m diameter culverts are required through the proposed on-slip ramp, existing underpass and proposed off-slip ramp.	51+010	51+040
	Structure 2 – Existing Bowes Hall underpass to be infilled.	Existing underpass will be infilled/ removed.	51+020	51+020
	Earthwork 4 – Cutting	Cutting up to 4m deep for eastbound merge.	51+000	51+200
	Earthwork 5– Embankment	Nominal earthworks for eastbound merge	51+200	51+300

Section	Feature	Description	Chainage start (m)	Chainage end (m)
	Earthwork 6 – Cutting	Cutting up to 3m deep for westbound diverge.	50+980	51+300
7.3	A67 junction to Blacklodge Farm Underpass		51+300	51+700
	Earthwork 1 – Cutting/ nominal cutting	Widening of existing alignment between A67 junction and Blacklodge Farm Underpass. Cutting up to 4m depth for westbound A66. Nominal cutting <2m for eastbound A66.	51+300	51+600
	Earthwork 2 – Cutting/Embankment	Nominal earthworks.	51+600	51+700
	Structure 1 – Extension of Blacklodge Farm Underpass	The existing structure will need to be extended to accommodate the widening of the A66.	51+700	51+700
7.4	Blacklodge Farm Underpass to end of scheme		51+650	52+941
	Earthwork 1 – Embankment	Embankment up to 4m, for A66 eastbound, nominal embankment and at-grade development for A66 westbound.	51+650	52+200
	Culvert S07-C07 extension	Extension to existing culvert at Stone Bridge Farm	52+165	52+165
	Earthwork 2 – Nominal cutting/ nominal embankment	Nominal cutting up to 1.5m for eastbound A66 and nominal embankment up to 2m for A66 westbound.	52+200	52+941
7.5	East Bowes Accommodation Overpass		52+200	52+500
	Earthwork 1 - Embankment	Embankments up to 8.8m for East Bowes Accommodation Overpass	52+200	52+500
	Structure 1 – New East Bowes accommodation overpass	New overpass to provide access over widened A66.	52+400	52+400

Table 4.1-2: Scheme 7 - Attenuation Ponds

Section	Pond	Approximate chainage (m)
7.1	Pond 1 to the south of the westbound carriageway.	50+200
7.2	Pond 2 to the south of the westbound diverge.	51+050
7.3	Pond 3 to the north of the eastbound carriageway.	51+600
7.4	Pond 4 to the south of the westbound carriageway.	52+050
7.4	Pond 5 to the south of the westbound carriageway.	52+600

4.1.5 The following reports contain further detail on each of the structures listed above:

- Scheme 7 Structures Options Report – Bowes Underbridge [22]
- Scheme 7 Structures Options Report – Underpasses [23]
- Scheme 7 Structures Options Report – East Bowes Accommodation Overbridge [24]

- Scheme 7 Structures Options Report – Culverts [25]
- Scheme 7 Structures Options Report – Clint Lane [26]

4.2 Scheme 7 Ground Conditions

4.2.1 The scheme wide ground conditions discussed here are based on data from the 2021 investigation supplemented by historical boreholes obtained from the BGS online dataviewer [13]. A summary of relevant sources of ground investigations is provided in Table 4.2-1. A full list is provided in Appendix C. Drawings HE565627-AMY-HGT-S07-DR-CE-200001-3 in Appendix A provide plan and longitudinal sections showing the proposed new alignment with the positions of relevant exploratory holes.

Table 4.2-1: Scheme 7 - Quantities of Exploratory Holes

Ground Investigation	Number of locations
Historical boreholes from BGS dataviewer	48
Allied Exploration Geotechnics, 2021	42

4.2.2 Exploratory holes in or close to the proposed scheme 7 works indicate the presence of the following geological strata.

- Topsoil
- Made Ground – cohesive and granular
- Glacial Deposits – cohesive
- Glacial Deposits – granular
- Mudstone
- Limestone
- Sandstone

4.2.3 In addition to the strata listed, peat was recorded in two locations in section 7.4 at shallow depth.

4.2.4 Relevant exploratory hole locations and a more detailed description of the materials encountered in each section of this scheme are presented under sub-headings 4.3, 4.4, 4.5, 4.6 and 4.7 of this report. A summary of the materials encountered is presented in Table 4.2-2 below.

Table 4.2-2: Scheme 7 – Summary of Materials Encountered

Strata	Scheme 7				
	7.1	7.2	7.3	7.4	7.5
Topsoil	✓	✓	✓	✓	✓
Made ground – cohesive and granular	✓	✓	✓	✓	-
Glacial Deposits – cohesive	✓	✓	✓	✓	✓
Glacial Deposits – granular	✓	✓	✓	✓	✓
Mudstone	✓	✓	✓	✓	✓
Limestone	✓	✓	✓	✓	✓
Sandstone	-	-	✓	✓	✓

- 4.2.5 Ground conditions within scheme 7 generally comprise a sequence of thin Topsoil or Made Ground overlying variable thicknesses of predominantly Cohesive Glacial Deposits and mudstone bedrock at depth.
- 4.2.6 Topsoil was encountered within 57 exploratory locations including historical holes and was typically 0.3m thick. It was typically described as a soft sandy slightly gravelly clay with rootlets. Glacial Deposits generally described as very clayey slightly gravelly sand with many rootlets, were recorded at ground level at 15 locations during the 2021 ground investigation to a maximum depth of 0.7m bgl. This description is consistent with Topsoil or cultivated material. The majority of historical locations recorded Topsoil and subsoil at ground level although no detailed description was provided.
- 4.2.7 Made Ground was encountered within 19 exploratory holes including historical ones and ranged between 0.14m and 2.3m thick, with a typical thickness of 0.5m. Made Ground 2.3m thick was recorded in BH BB002, which was carried out on an existing farm access track adjacent to Clint Lane. WS BB002, located on the verge of a farm access track west of Bowes village recorded Made Ground from the surface to 1.2m bgl.
- 4.2.8 Made Ground typically comprised clayey slightly gravelly sand and frequently included rootlets where encountered at ground level. Locally, Made Ground comprised cohesive deposits of sandy gravelly clay. Some anthropogenic material was recorded in the majority of locations where Made Ground was recorded including brick and occasionally coal, clinker and ash.
- 4.2.9 In one historical hole (NZ01SW12), located south of approx. Ch. 52+000m of the main route alignment material described as 'peat with dark reddish brown clay – highly organic' was recorded from 0.17 to 0.54m bgl, beneath Topsoil. TP BB0012 located to the north of Ch52+350m recorded slightly peaty slightly sandy organic silt within material described as Topsoil.
- 4.2.10 Glacial Deposits were present in all exploratory holes beneath Topsoil and Made Ground, with the exception of those locations where ground levels have been reduced by previous developments, for example boreholes BH BB010, BH BB011 and BH BB012 undertaken at the A67 underpass. In this area Made Ground directly overlies rock.
- 4.2.11 Glacial Deposits were typically proven to range between 3m and 7m thick, but were locally thicker towards the east of the scheme. Glacial Deposits were recorded as 17m thick within BH BB023 and 13m thick in BH BB024. The Glacial Deposits predominantly comprised Cohesive Glacial Deposits of soft to firm, becoming firm to stiff with depth, grey brown slightly sandy slightly gravelly clay with medium cobble content, with gravel of sandstone, mudstone and limestone.
- 4.2.12 Locally, predominantly in the west and central areas of the site, Granular Glacial materials were encountered beneath the Cohesive Glacial Deposits, with a maximum thickness of at least 7.3m in BH BB005. These comprise very clayey slightly gravelly sands and clayey sandy gravels.
- 4.2.13 Bedrock was recorded within 51 exploratory holes including historical ones and was encountered at depths ranging between 0.15m bgl (TP BB003) and 17m bgl (BH BB023). Rockhead was shallowest in the area of the A67 underpass, which is anticipated to have been constructed directly onto rock. Rockhead predominantly comprised mudstone in the west of the scheme and limestone in the central and eastern areas of the scheme.
- 4.2.14 Groundwater monitoring was carried out over a period of approximately 5 months following completion of fieldwork with 6 rounds of monitoring.
- 4.2.15 The available information indicates that bedrock is commonly saturated across the site, with piezometric depths from installations in the bedrock typically at or around rockhead level. Installations in the Glacial Deposits typically recorded stabilised levels at 1m to 2.5m bgl, occasionally deeper (approximately 4m bgl) within Granular Glacial Deposits. Two installations, BH BB022 and BH BB025, in the east of the scheme recorded levels at less than 1m bgl. Multiple groundwater strikes were recorded during drilling in both historical and recent ground investigations. The depth of strikes ranged from as shallow as 0.65m bgl to 8.5m bgl.

- 4.2.16 Summaries of laboratory and in-situ data available for each section are presented under sub-headings 4.3, 4.4, 4.5, 4.6 and 4.7. The plots summarised in Table 4.2-3 have been produced to support the interpretation of field and laboratory data. These are included in Appendix D.
- 4.2.17 Measured SPT N values have been corrected for energy losses, giving N_{60} values. Where no energy ratio is provided, for instance in historical holes, an energy ratio of 60% has been assumed.
- 4.2.18 It is noted that some historical logs included laboratory test results, which have been included in the tables and figures included in this report.

Table 4.2-3: Scheme 7 - Geotechnical Figures

Figure Name	Figure Reference					
	Scheme 7	Section 7.1	Section 7.2	Section 7.3	Section 7.4	Section 7.5
Natural Moisture Content & Atterberg Limits	S7-1	S7.1-1	S7.2-1	S7.3-1	S7.4-1	S7.5-1
Plasticity Chart	S7-2	S7.1-2	S7.2-2	S7.3-2	S7.4-2	S7.5-2
PSD Grading Curves	S7-3	S7.1-3	S7.2-3	S7.3-3	S7.4-3	S7.5-3
Bulk Density	S7-4	-	-	-	-	-
Particle Density	S7-5	-	-	-	-	-
SPT Value	S7-6	S7.1-4	S7.2-4	S7.3-4	S7.4-4	S7.5-4
Undrained Shear Strength (GD-C)	S7-7	S7.1-5	S7.2-5	S7.3-5	S7.4-5	S7.5-5
Shearbox	S7-8	-	-	-	-	-
Consolidated Undrained Triaxial	S7-9	-	-	-	-	-
Oedometer (mv at stress increment)	S7-10	-	-	-	-	-
Compaction Test Curves	S7-11	-	-	-	-	-
Compaction Max Density vs. Optimum Moisture Content	S7-12	-	-	-	-	-
MCV vs Moisture Content	S7-13	-	-	-	-	-
CBR (top) vs Moisture Content	S7-14	-	-	-	-	-
CBR (bottom) vs Moisture Content	S7-15	-	-	-	-	-
Plate Load Test	S7-16	-	-	-	-	-

Figure Name	Figure Reference					
	Scheme 7	Section 7.1	Section 7.2	Section 7.3	Section 7.4	Section 7.5
Permeability In-situ	S7-17	-	-	-	-	-
Rock Moisture Content	S7-18	-	-	-	-	-
Rock Point Load - Axial	S7-19a	-	-	-	-	-
Rock Point Load - Diametral	S7-19b	-	-	-	-	-
Rock Point Load - Irregular Lump	S7-19c	-	-	-	-	-
Rock UCS	S7-20	-	-	-	-	-
Groundwater Monitoring	S7-21	-	-	-	-	-

4.3 Section 7.1 - Ch.50+000m to Lyndale Farm Underpass

4.3.1 Exploratory holes relevant to this section are given in Table 4.3-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:

- Topsoil
- Made Ground
- Glacial Deposits – Cohesive
- Glacial Deposits – Granular
- Mudstone
- Limestone

4.3.2 The reported ground level at BH BB002 is considered to be incorrect as this appears to be significantly higher than the surrounding ground.

Table 4.3-1: Section 7.1 – Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Durham County Council, 1975 (British Geological Survey)	NY91SE23	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE24	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE25	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE26	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE27	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE28	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE29	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE30	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE31	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE32	Cable percussive borehole

Source/Date	Borehole ID	Type
Durham County Council, 1974 (British Geological Survey)	NY91SE33	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE34	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NY91SE44/A	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NY91SE44/D	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	WS BB002	Window sampling borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB002	Rotary open hole
Allied Exploration Geotechnics Ltd, 2021.	BH BB003	Rotary core & rotary open hole follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB004	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB005	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB006	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB007	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB008	Cable percussive borehole & rotary core follow on
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP BB001	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB002	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB005	Trial Pit

Topsoil

- 4.3.3 Topsoil was recorded in 17 locations along section 7.1, typically 0.3m thick but locally up to 0.45m. Topsoil was recorded in three location from the 2021 ground investigation where it was typically described as soft dark brown sandy slightly gravelly clay with many rootlets. Where anthropogenic material such as ceramic tile or brick is present, the Topsoil was typically recorded as Made Ground.
- 4.3.4 A summary of laboratory data available for Topsoil is presented in Table 4.3-2, graphical data are presented as figures where applicable in Appendix D.

Table 4.3-2: Section 7.1 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Average	Mean
Classification				
Natural Moisture Content (%)	1	36	36	36
Liquid Limit (%)	1	38	38	38
Plastic Limit (%)	1	38	38	38
Plasticity Index (%)	1	N/A	N/A	N/A

Made Ground

- 4.3.5 Made Ground was encountered in eight locations on section 7.1. In five of these locations it was encountered at ground level. The material encountered at the surface was recorded to a maximum depth of 0.6m often with a description consistent with Topsoil with some anthropogenic material such as brick. Other material recorded at ground level includes coke ash (NY91SE23) and grey sandy gravel (BH BB002).
- 4.3.6 Made Ground was encountered to a depth of 1m or greater on:
- BH BB002: Farm access tracks adjoining Clint Lane
 - WS BB002: On the verge of a farm access track west of Bowes village
 - TP BB005: In a field approximately 120m south of the A66 alignment
- 4.3.7 Made Ground at the farm access tracks adjoining Clint Lane is up to 2.3m thick. A layer of dark grey sandy gravel up to 0.6m thick was recorded in both BH BB002 and BH BB004. Constituents include dolomite, limestone, macadam and sandstone. In BH BB002 a 2m thick layer of reworked Cohesive Glacial Deposits was present beneath, to a depth of 2.3m bgl.
- 4.3.8 Made Ground at WS BB002 extends to 1.2m bgl beneath the Topsoil and was composed of reworked Cohesive Glacial Deposits. Granular constituents include sandstone, mudstone and coal.
- 4.3.9 Made Ground recorded in TP BB005 extends to 1m bgl beneath the Topsoil and was composed of reworked Cohesive Glacial Deposits. Granular constituents include coal, clinker, sandstone, pottery, clinker and timber.

Table 4.3-3: Section 7.1 - In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	4	8.4-43	25.85	26
Liquid Limit (%)	2	22-36	29	29
Plastic Limit (%)	2	12-21	16.5	16.5
Plasticity Index (%)	2	10-15	12.5	12.5
PSD	3	N/A	N/A	N/A
Strength				
SPT N value ¹	1	22	22	22
SPT N ₆₀ value ¹	1	22	22	22
Compaction				
MCC (multi-point MCV)	5 (1)	4.6-13.8	N/A	N/A
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 7.1-4 for full extrapolated values.				

Glacial Deposits – Cohesive

- 4.3.10 Cohesive Glacial Deposits form the major superficial material across this section, and were encountered in all locations from the 2021 ground investigation, from a depth of 0.3m bgl, beneath Topsoil. Cohesive Glacial Deposits were also recorded in the historical ground investigation locations although these locations were not logged to modern standards and consequently the descriptions have not been interpreted in detail.

- 4.3.11 The Cohesive Glacial Deposits were typically described as brown or grey, soft or firm (occasionally firm to stiff) slightly sandy slightly gravelly clay, with cobbles and occasionally boulders. The deposits are shown to increase in strength with depth, becoming stiff at approximately 3m bgl.
- 4.3.12 The presence and proportion of granular constituents were variable. Cobbles were recorded in seven locations, boulders were recorded in three locations.
- 4.3.13 Gravel was typically described as fine to medium or fine to coarse subangular to subrounded of mudstone, sandstone and limestone. Cobbles were also subangular to subrounded of mudstone, sandstone and limestone. Boulders were limestone and mudstone.

Table 4.3-4: Section 7.1 - In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle Density (Mg/m ³)		5	2.54 – 2.66	2.61	2.61
Bulk Unit Weight (kN/m ³)		15	18.25 – 22.37	19.03	19.83
Natural Moisture Content (%)		95	9-40	19	17
Liquid Limit (%)		100	17 - 51	34	33
Plastic Limit (%)		100	8-28	16	15
Plasticity Index (%)		100	0-26	18	17
PSD		11	N/A	N/A	N/A
Strength					
SPT N value ¹		21	6->100	43	20
SPT N ₆₀ value ¹		21	6->100	42	18
HSV (field), cu ² (kPa)		21	34 – 55	42	41
Consolidated Undrained Triaxial Tests	φ'peak (°)	1	32	32	32
	c'peak (kPa)	1	1	1	1
Direct Shear Test	φ'peak (°)	6	24-30	28	28
	c'peak (kPa)	6	0-10	3.7	2.5
Compaction					
Plate Load Test, CBR (%)		2	1.90 - 2.39	2.15	2.15
Lab CBR (%)		4 (2)	0.7 – 2.1	1.3	1.2
Compaction	Maximum dry density (Mg/m ³)	7	1.86 – 2.14	2.0	1.9
	OMC (%)	7	9.5 – 15	12.1	12.0
MCC (multi-point MCV)		30 (6)	2.6 – 16.6	N/A	N/A
MCV (at NMC)		4	1.6 – 7.5	5.3	6

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
¹ For SPT N ₆₀ /N values, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.1-4 for full extrapolated values. ² HSV results are measured values and have not been corrected.				

Glacial Deposits – Granular

- 4.3.14 Granular Glacial Deposits were recorded in five locations from the 2021 ground investigation.
- 4.3.15 In three locations (BH BB006, BH BB007 and BH BB008) it was present from ground level up to a depth of 0.7m bgl, and was typically described as brown very clayey slightly gravelly sand with many rootlets. Sand was fine to coarse. Gravel was fine to medium subangular and included sandstone and mudstone. This was consistent with a description of Topsoil.
- 4.3.16 In three further locations (BH BB002, BH BB005, BH BB006), it was encountered at greater depth. In BH BB002 dark brown clayey slightly sandy gravel was recorded from a depth of 2.9m bgl to the base of the hole at 5m bgl. In borehole BH BB005, gravel with cobbles was recorded from 1.2m bgl to the base of the hole at 8.5m bgl, described as slightly clayey and sandy to 3.8m bgl and very sandy thereafter. In BH BB006 sandy gravel was recorded from 3.3m bgl to geological rockhead at 5.1m bgl, the gravel was described as clayey to 4.8m bgl.
- 4.3.17 The presence of Granular Glacial Deposits has also been interpreted from the logged description of nine historical holes. Logged descriptions including '*sandy loam*', and '*gravel and sand in a clay binder*' have been interpreted as granular although these should be treated as indicative only.

Table 4.3-5: Section 7.1 - In-situ and Laboratory Test Results for Glacial Deposits - Granular

In-situ/ laboratory test results	No. of tests	Range	Average	Median
Classification				
Particle Density (Mg/m ³)	2	2.59 – 2.64	2.62	2.62
Bulk Unit Weight (kN/m ³)	1	21.68	21.68	21.68
Natural Moisture Content (%)	13	13-69	27	24
Liquid Limit (%)	10	29-44	35	33
Plastic Limit (%)	10	13-26	19	17
Plasticity Index (%)	10	14-20	16	16
PSD	3	N/A	N/A	N/A
Strength				
SPT N value ¹	12	4 – 35	17	15
SPT N ₆₀ value ¹	12	4 – 32	15	14
Direct Shear Test	φ ['] peak (°)	1	28	28
	c ['] peak (kPa)	1	3	3
Compaction				

In-situ/ laboratory test results	No. of tests	Range	Average	Median
Lab CBR (%)	2 (1)	0.21-0.27	0.24	0.24

¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.1-4 for full extrapolated values.

Mudstone (Stainmore Formation)

4.3.18 Mudstone was encountered in five locations from the 2021 ground investigation from a depth of 4m bgl (BH BB008) to 8.8m bgl (BH BB003). In historical holes mudstone was encountered at several locations from a depth of 1.5m bgl, described as mudstone in a clay binder. It is noted that for several historical holes ground levels may have been altered by earthworks associated with the construction of the existing A66.

4.3.19 The mudstone was typically described in the 2021 logs as weak, grey and distinctly weathered when first encountered, often recovered as gravel, becoming partially weathered and increasing in strength to medium strong or strong with depth.

Table 4.3-6: Section 7.1 - In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	9	6-20	13	12
Liquid Limit (%)	6	28-40	34	35
Plastic Limit (%)	6	15-21	18	18
Plasticity Index (%)	6	11-19	16	17
Strength				
SPT N value ¹	15	8->100	54	61
SPT N ₆₀ value ¹	15	10->100	80	>100
Point Load Index	41	0.2 – 10	2.33	0.9

¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.1-4 for full extrapolated values.

Limestone (Great Limestone Formation)

4.3.20 Limestone was recorded in three locations. In BH BB007 and BH BB008 it was recorded at a depth of 11.35m bgl and 10.9m bgl respectively, beneath the overlying mudstone. In TP BB005, a significant distance from the A66 alignment, it was recorded at a depth of 4.3m bgl, beneath the superficial deposits, consistent with available geological mapping.

4.3.21 The limestone was described as medium strong fossiliferous and partially weathered in BH BB007, becoming medium strong to strong from 15.2m bgl. In BH BB008 it was described as very strong and distinctly weathered (becoming partially weathered with depth). A 0.6m thick zone of mudstone/limestone interbeds was recorded in borehole BH BB008 from 13m bgl to 13.6m bgl.

4.3.22 One SPT test was undertaken within Limestone, which achieved a total penetration of 26mm from 100 blows.

Table 4.3-7: Section 7.1 - In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
SPT N and N ₆₀ value ¹	1	>100	>100	>100
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.1-4 for full extrapolated values.				

Groundwater

4.3.23 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 4.3-8.

4.3.24 Where piezometers were installed in the 2021 ground investigation, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 and a further round on 27 August 2021. Groundwater monitoring information is provided in Table 4.3-9 below and Figure 7-21.

Table 4.3-8: Section 7.1 – Groundwater Strikes Information

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH BB003	8.5	279.1	-	-	-	Glacial Deposits – cohesive	-
BH BB004	4.2	284.5	2.8	285.9	20	Glacial Deposits - Cohesive	Moderate inflow
BH BB005	3.8	288.9	2.7	290.0	20	Glacial Deposits – Granular	Water strike at base of clayey sandy gravel (top of very sandy gravel).
BHBB006	4.8	287.1	4.1	287.8	20	Glacial Deposits - Granular	Moderate inflow. Water strike at base of clayey sandy gravel (top of sandy gravel).
BH BB008	2.3	288.9	1.8	289.4	20	Glacial Deposits – Cohesive	Fast inflow
NY91SE23	3.2	285.7				Mudstone	
NY91SE24	2.8	289.3				Glacial Deposits – Cohesive	
NY91SE25	2.2	291.8	2	292.1	15	Glacial Deposits – Cohesive	
NY91SE25	6	288.1	5.3	288.7	0	Mudstone	

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
NY91SE27	1.34	288.3	1.26	288.4	5	Glacial Deposits – Granular	
NY91SE28	2.9	286.6	2.2	287.3	0	Mudstone	
NY91SE29	2.2	286.3	2	286.5	5	Glacial Deposits – Cohesive	
NY91SE30	2	285.6	1.6	286	5	Glacial Deposits – Cohesive	
NY91SE31	2	286.1	1.1	286.9	10	Glacial Deposits – Cohesive	
NY91SE32	2	285	1.7	285.3	10	Glacial Deposits – Cohesive	
NY91SE33	5.4	281.7				Mudstone	
NY91SE44/D	4.8	289	4.1	289.7	15	Glacial Deposits – Granular	

Table 4.3-9: Section 7.1 – Groundwater Monitoring Information

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB002	4.30m 19mm SPIE	2.2 (294.1)	2.2 (294)	2.3 (294)	2.3 (294)	2.2 (294)	2.4 (293.9)	Glacial Deposits – Granular	Groundwater stabilised at the base of the Made Ground
BH BB003	11.00m 19mm SPIE	7.5 (280)	7.5 (280.1)	7.6 (280)	7.6 (280)	7.6 (280)	7.7 (279.9)	Mudstone	-
BH BB004	4.50m 19mm SPIE	1.5 (287.3)	1.4 (287.4)	1.4 (287.3)	1.5 (287.3)	1.4 (287.3)	1.8 (287)	Glacial Deposits - Cohesive	-
BH BB005	5.00m 19mm SPIE	3.9 (288.9)	3.9 (288.8)	4 (288.7)	4 (288.7)	4 (288.8)	4.1 (288.6)	Glacial Deposits - Granular	Groundwater stabilised at base of clayey sandy gravel (top of very sandy gravel).

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB006	5.00m 19mm SPIE	4.1 (287.8)	4.2 (287.7)	4.4 (287.5)	4.4 (287.5)	4.3 (287.6)	Dry	Glacial Deposits – Granular/ Mudstone	Groundwater stabilised above base of clayey sandy gravel as per water strike
BH BB007	12.00m 50mm SP	4.5 (287.2) 4.4 (287.2)	4.5 (287.2)	4.5 (287.2)	4.4 (287.3)	4.3 (287.3)	4.3 (287.4)	Mudstone/ Limestone	Groundwater stabilised at rockhead level
BH BB008	2.50m 19mm SPIE	0.7 (290.5)	1 (290.2)	1.3 (289.9)	1.3 (289.9)	1.1 (290.1)	1.8 (289.4)	Glacial Deposits - cohesive	-
WS BB002	2.50m 19mm SPIE	Damp	N/A	Dry	N/A	Dry	N/A	Glacial Deposits - cohesive	-

- 4.3.25 The groundwater strikes data and monitoring information indicate bedrock is likely to be saturated across the site. Groundwater levels within superficial deposits are variable and were recorded during monitoring as shallow as 0.7m bgl indicating possible perched water.
- 4.3.26 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 4.3.27 Several ground investigation locations, both from the 2021 ground investigation and historical ground investigations recorded water strikes in both the mudstone bedrock and superficial deposits. Water strikes were observed at varied depths from 1.3 to 8.5m bgl in the Glacial Deposits and from 2.9 to 6m bgl in the mudstone bedrock. This corresponds with seepages identified in the PSSR on a number of earthworks along section 7.1 indicating a shallow groundwater regime in the area.
- 4.3.28 Combined drains and kerbs are present along the existing carriageway and a combination of cut-off ditches and filter drains are proposed at the top of the cuttings to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 4.3.29 For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level.

4.4 Section 7.2 - A67 Junction

- 4.4.1 Exploratory holes relevant to this section are given in Table 4.4-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
- Topsoil
 - Made Ground
 - Glacial Deposits – cohesive
 - Glacial Deposits – granular
 - Mudstone
 - Limestone
 - Sandstone

Table 4.4-1: Section 7.2 – Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Durham County Council, 1975 (British Geological Survey)	NY91SE10	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE14	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE15	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE16	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE17	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE18	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE19	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE20	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE21	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE21A	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE22	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NY91SE23	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE24	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NY91SE44/B	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NY91SE44/C	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NY91SE5	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NY91SE6	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NY91SE7	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NY91SE8	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB007	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB008	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB009	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB010	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB011	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB012	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB013	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB014	Cable percussive borehole & rotary core follow on

Source/Date	Borehole ID	Type
Allied Exploration Geotechnics Ltd, 2021.	BH BB015	Cable percussive borehole
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP BB002	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB003	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB004	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB006	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB007	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	HDP BB001	Hand-dug trial pit

Topsoil

- 4.4.2 Topsoil up to 0.4m thick was recorded in three locations from the 2021 ground investigation (HDP BB001, TP BB002 and TP BB003) and 14 locations from historical exploratory holes. It was typically described as soft dark brown sandy slightly gravelly clay with many rootlets.
- 4.4.3 A summary of testing data available for Topsoil is presented in Table 4.4-2, graphical data are presented as figures where applicable.

Table 4.4-2: Section 7.2 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.45	2.45	2.45
Natural Moisture Content (%)	2	20-27	23.5	23.5
Liquid Limit (%)	1	47	47	47
Plastic Limit (%)	1	32	32	32
Plasticity Index (%)	1	15	15	15
PSD	2	N/A	N/A	N/A

Made Ground

- 4.4.4 Made Ground was recorded in nine locations on the site with a maximum thickness of 0.6m. In the majority of locations the material description was consistent with that of Topsoil or natural Glacial Deposits with some anthropogenic material such as brick, ash, or ceramic tile present.

Table 4.4-3: Section 7.2 - In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.64	2.64	2.64
Natural Moisture Content	2	52-60	56	56

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
PSD	3	N/A	N/A	N/A

Glacial Deposits – Cohesive

- 4.4.5 Cohesive Glacial Deposits form the major superficial material across the site and were encountered from a minimum depth of 0.15m bgl, beneath Topsoil, in the 2021 ground investigation locations. Material described as 'clay overburden' was recorded at ground level in historical location NY91SE44/B.
- 4.4.6 The maximum depth Cohesive Glacial Deposits was recorded was 5.1m bgl (NY91SE44/C), typically overlying the bedrock, although the base of the Cohesive Glacial Deposits was not proven in all locations.
- 4.4.7 The Cohesive Glacial Deposits were typically described as brown or grey, firm (occasionally soft or firm to stiff) slightly sandy slightly gravelly clay, with cobbles and occasionally boulders. The presence and proportion of the granular constituents were variable. The deposits increase in strength with depth, becoming stiff at approximately 3m bgl.
- 4.4.8 Gravel was typically described as fine to medium or fine to coarse subangular to subrounded of mudstone, sandstone and limestone. Cobbles were also subangular to subrounded of mudstone, sandstone and limestone. Boulders were limestone, sandstone and mudstone.

Table 4.4-4: Section 7.2 - In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	9	2.54-2.67	2.62	2.65
Buk Unit Weight (kN/m ³)	15	17.17-22.56	20.48	21.28
Natural Moisture Content (%)	88	10-92	20	19
Liquid Limit (%)	91	26-93	37	37
Plastic Limit (%)	91	12-59	18	17
Plasticity Index (%)	91	12-42	19	18
PSD	15	N/A	N/A	N/A
Strength				
SPT N value ¹	12	10 - >100	36	32
SPT N ₆₀ value ¹	12	9 - >100	37	31
Unconsolidated Undrained, c _u (kPa)	1	56	56	56
HSV (lab), c _u (kPa) ²	2	27-80	54	54
HSV (field), c _u (kPa) ²	39	34-120	52	41
Consolidated Undrained Triaxial Tests	ϕ ¹ _{peak} (°)	1	32	32
	c ¹ _{peak} (kPa)	1	1	1
Direct shear test	ϕ ¹ _{peak} (°)	4	28-33	30

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
	c _{peak} (kPa)	4	6-18	10	9
Compaction					
Plate Load Test, CBR (%)		2	1.90-2.39	2.15	2.15
Lab CBR (%)		10 (5)	0.49-2.1	1.1	1.2
Compaction	Maximum dry density (Mg/m ³)	8	1.86-2.15	2.03	2.06
	OMC (%)	8	7-14	10.75	10.75
MCV from MCC (multi-point)		35 (7)	2.9-15.7	N/A	N/A
MCV (at NMC)		8	0.8-10.6	6.8	7.3
<p>¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.2-4 for full extrapolated values.</p> <p>² HSV results are measured values and have not been corrected. One sample exceeded the device measuring range of 120kPa. A value of 120kPa has been used for calculation of the statistics in this table.</p>					

Glacial Deposits – Granular

- 4.4.9 Granular Glacial Deposits were recorded in six locations from the 2021 ground investigation. In each of these locations it was present from ground level to a maximum depth of 0.7m bgl. Material descriptions were generally consistent with Topsoil although in BH BB013 from 0.23 to 0.45m bgl no organic material was recorded.
- 4.4.10 Six historical locations recorded material interpreted as Granular Glacial Deposits although it was difficult to accurately determine the material from the descriptions available. Granular Glacial Deposits were recorded to a depth greater than 1m bgl in two locations, from 3.3 to 6.3m bgl in NY91SE24 (sand with some gravel in a silty / clay) and from 0.6 to 1.4m bgl in NY91SE18 (gravel with some sand in a silty clay binder).
- 4.4.11 The 2021 ground investigation did not encounter Granular Glacial Deposits at depths greater than 0.7m bgl along this section. This material was recorded in several historical exploratory holes, although as discussed above these were not logged to modern standards.

Table 4.4-5: Section 7.2 - In-situ and Laboratory Test Results for Glacial Deposits - Granular

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	6	12-55	30.5	26.5
Liquid Limit (%)	5	32-44	38.4	39
Plastic Limit (%)	5	19-24	21.2	20
Plasticity Index (%)	5	12-24	17.2	15
PSD	1	N/A	N/A	N/A

Mudstone (Stainmore Formation)

- 4.4.12 Mudstone was encountered in nine exploratory holes from the 2021 ground investigation and several historical locations. It was first encountered at shallow depth, approximately 0.5m bgl

or shallower in several locations adjacent to the existing A67 junction in BH BB010, BH BB011, BH BB012, HDP BB001 and TP BB003.

- 4.4.13 The mudstone was typically described as weak and distinctly weathered where first encountered becoming medium strong with depth.
- 4.4.14 The deepest mudstone was recorded to a depth of 13.6m bgl in BH BB008. It is noted that at this depth the rock was described as very strong to extremely strong mudstone/ limestone interbeds.

Table 4.4-6: Section 7.2 - In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	3	24.36-25.40	25.04	25.37
Natural Moisture Content (%)	21	5-36 ²	16	16
Liquid Limit (%)	16	27-43	36	36
Plastic Limit (%)	16	13-22	19	19
Plasticity Index (%)	16	12-23	17	17
PSD	1	N/A	N/A	N/A
Strength				
SPT N value ¹	28	36 - >100	60	60
SPT N ₆₀ value ¹	28	33 - >100	82	>100
Rock Water Content (%)	8	3.5-6.1	4.93	5.15
UCS (MPa)	3	10.1-39.3	29.4	38.8
Point Load Index	97	0.1-10	1.24	0.5
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.2-4 for full extrapolated values. ² The majority of values fall within 5% and 27% with a single outlier at 36% from 6m bgl at historical hole NY91SE15.				

Limestone (Great Limestone Formation)

- 4.4.15 Limestone was recorded in five locations from a minimum depth of 7.1m bgl in BH BB012 to a maximum depth of 20m bgl (base of stratum unproved).
- 4.4.16 It was typically described as medium strong to strong, occasionally very strong, fossiliferous, and partially weathered or unweathered. As noted above some interbedded mudstone and limestone was also recorded.

Table 4.4-7: Section 7.2 - In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	5	25.78-26.48	26.28	26.46

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
SPT N value ¹	1	>100	>100	>100
SPT N ₆₀ value ¹	1	>100	>100	>100
UCS (MPa)	4	89.5-142	106.5	97.25
Point Load Index	5	1.9-6.9	4.54	5.2

¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.2-4 for full extrapolated values.

Groundwater

- 4.4.17 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 4.4-8.
- 4.4.18 Where piezometers were installed in the 2021 ground investigation, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 and a further round on the 27 August 2021. Groundwater information is provided in Table 4.4-9 below and Figure 7-21.

Table 4.4-8: Section 7.2 - Groundwater Strikes Information

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH BB008	2.3	288.9	1.8	289.4	20	Glacial Deposits – Cohesive	Fast inflow
BH BB009	5	284.9	2.8	287.1	20	Mudstone	Fast inflow
BH BB015	4.4	282.8	3.4	283.9	20	Glacial Deposits – Cohesive	
NY91SE15	2.7	284.9				Glacial Deposits – Cohesive	
NY91SE15	5	282.6	3.6	284.0	5	Mudstone	
NY91SE16	1.5	285.5				Glacial Deposits – Cohesive	
NY91SE16	4.8	282.3	4.3	282.8	10	Mudstone	
NY91SE17	2.8	282.9	2.6	283.0	10	Mudstone	
NY91SE18	2.6	284.5				Glacial Deposits – Cohesive	
NY91SE19	2.4	284.1				Mudstone	
NY91SE20	4.5	285.1				Glacial Deposits – Cohesive	
NY91SE20	5	284.5				Mudstone	
NY91SE21	2.3	286.8	2.1	287.0	5	Glacial Deposits – Cohesive	
NY91SE21	5.3	283.8	4.6	284.5	5	Mudstone	

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
NY91SE21A	1.2	289.1				Glacial Deposits – Cohesive	
NY91SE21A	2.56	287.69	2.54	287.71	0	Mudstone	
NY91SE23	3.2	285.7				Mudstone	
NY91SE24	2.8	289.3				Glacial Deposits – Cohesive	
NY91SE44/C	5.1	285.1	4.5	285.7	20	Mudstone	
NY91SE6	0.9	284.7	0.77	284.9	60	Glacial Deposits – Cohesive	
NY91SE7	2.7	282.9	2.2	283.3	10	Mudstone	
NY91SE	2.7	284.9				Glacial Deposits – Cohesive	
NY91SE	5	282.6	3.6	284.0	5	Mudstone	

Table 4.4-9: Section 7.2 – Groundwater Monitoring Information

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB007	12.00m 50mm SP	4.5 (287.2) 4.4 (287.2)	4.5 (287.2)	4.5 (287.2)	4.4 (287.3)	4.3 (287.3)	4.3 (287.3)	Mudstone/ Limestone	Groundwater stabilised at rockhead level
BH BB008	2.50m 19mm SPIE	0.7 (290.5)	1 (290.2)	1.3 (289.9)	1.3 (289.9)	1.1 (290.1)	1.8 (289.4)	Glacial Deposits - Cohesive	-
BH BB009	6.50m 19mm SPIE	3.6 (286.3)	3.7 (286.2)	4.0 (286.0)	3.8 (286.2)	3.7 (286.2)	4.0 (286.0)	Mudstone	-
BH BB010	2.00m 19mm SPIE	Dry	Dry	Dry	Dry	Dry	Dry	Mudstone	-
BH BB011	4.00m 19mm SPIE	1.3 (282.1)	1.3 (282.1)	1.4 (282.1)	1.3 (282.1)	1.2 (282.2)	1.4 (282.0)	Mudstone	-
BH BB012	8.00m 50mm SP	2.1 (280.4)	2.1 (280.5)	2.1 (280.4)	2.1 (280.4)	2.1 (280.5)	2.1 (280.4)	Limestone	-

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB013	4.00m 50mm SP	2.8 (288.0)	2.9 (287.9)	2.5 (288.3)	2.3 (288.5)	N/A	1.6 (289.2)	Glacial Deposits – Cohesive	-
BH BB014	3.00m 19mm SPIE	1.3 (283.2)	1.5 (283.1)	1.8 (282.8)	2.0 (282.6)	1.8 (282.8)	2.2 (282.3)	Glacial Deposits – Cohesive	-
BH BB015	2.00m 19mm SPIE	1.5 (285.7)	1.5 (285.7)	Dry	Dry	Damp	Dry	Glacial Deposits – Cohesive	-

- 4.4.19 Groundwater monitoring installation locations within the bedrock generally recorded standing water levels at or around the top of rock/ base of superficial deposits. Examples include the installations in boreholes BH BB007, BH BB009, BH BB011 and BH BB012. It is noted that the installation in BH BB010 was dry, which may be a result of variable groundwater levels or the effect of local drainage associated with the A67.
- 4.4.20 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 4.4.21 A water strike at 5m bgl in mudstone in BH BB009 rose to 2.8m bgl, within the superficial deposits, after 20 minutes.
- 4.4.22 Groundwater monitoring installations located in the superficial deposits generally recorded standing water levels between 1 and 3m bgl indicating possible perched water. Two water strikes were recorded from the 2021 ground investigation in superficial deposits, at 2.3m bgl in BH BB008 and at 4.4m bgl in BH BB015.
- 4.4.23 Several historical ground investigation locations recorded water strikes in both the mudstone bedrock and superficial deposits. Water strikes were observed at varied depths from 0.9 to 4.5m bgl in the Cohesive Glacial Deposits and from 2.4 to 5.3m bgl in the mudstone bedrock.
- 4.4.24 Combined drains and kerbs are present along the existing carriageway and a combination of cut-off ditches and filter drains are proposed at the top of the cuttings to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 4.4.25 For the purposes of geotechnical design, groundwater levels should be assumed to be at rockhead level, however, the presence of perched water in the superficial deposits should not be discounted.

4.5 Section 7.3 - A67 Junction to Blacklodge Farm Underpass

- 4.5.1 Exploratory holes relevant to this section are given in Table 4.5-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
- Topsoil
 - Made Ground
 - Glacial Deposits – cohesive
 - Glacial Deposits – granular
 - Mudstone
 - Limestone
 - Sandstone

Table 4.5-1: Section 7.3 – Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Durham County Council, 1975 (British Geological Survey)	NY91SE5	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW14	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW15	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NZ01SW16	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NZ01SW58	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB015	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB016	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB017	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB018	Cable percussive borehole & rotary core follow on
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP BB008	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB009	Trial Pit

Topsoil

- 4.5.2 Topsoil up to 0.5m thick was recorded in one location from the 2021 ground investigation (BH BB017) and four locations from historical exploratory holes.
- 4.5.3 A summary of testing data available for Topsoil is presented in Table 4.5-2, graphical data are presented as figures where applicable.

Table 4.5-2: Section 7.3 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.52	2.52	2.52
Natural Moisture Content (%)	1	41	41	41
Liquid Limit (%)	1	53	53	53
Plastic Limit (%)	1	35	35	35
Plasticity Index (%)	1	18	18	18

Made Ground

- 4.5.4 Made Ground was recorded in three locations from the 2021 ground investigation. In TP BB008 and TP BB009 Made Ground was encountered up to 0.45m thick at ground level and was described as Topsoil with ceramic tile present. In BH BB018, close to the existing underpass, granular Made Ground was present and comprised sandy gravel of macadam, mudstone and limestone from ground level to 0.4m bgl and gravel and cobbles of mudstone and limestone to 0.6m bgl.

Table 4.5-3: Section 7.3 - In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	1	28	28	28

Glacial Deposits – Cohesive

- 4.5.5 Cohesive Glacial Deposits form the major superficial material across the site and were encountered from a minimum depth of 0.17m bgl in the 2021 ground investigation locations, beneath Topsoil. Material described as 'clay overburden' was recorded at ground level in historical location NZ01SW58.
- 4.5.6 The maximum depth the Cohesive Glacial Deposits was recorded was 2.6m bgl (TP BB009). The majority of exploratory holes terminated on possible bedrock at the base of the Cohesive Glacial Deposits, for example BH BB017 at 2.4m bgl.
- 4.5.7 The Cohesive Glacial Deposits were typically described as brown or grey, soft or firm, slightly sandy slightly gravelly clay, often with cobbles and occasionally boulders. The presence and proportion of the granular constituents was variable. In general, firm clay appeared to be present in the west of this section of the scheme (BH BB015, BH BB016) and soft material in the east of the section (BH BB017, TP BB008, TP BB019).
- 4.5.8 Gravel was typically described as fine to medium or fine to coarse subangular to subrounded of mudstone, sandstone and limestone. Cobbles were also subangular to subrounded of mudstone, sandstone and limestone. Boulders were limestone and sandstone.

Table 4.5-4: Section 7.3 - In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	3	2.56-2.67	2.61	2.61
Natural Moisture Content (%)	14	18-46	28	25
Liquid Limit (%)	12	31-61	45	46
Plastic Limit (%)	12	17-32	23	24
Plasticity Index (%)	12	12-29	21	22
PSD	5	N/A	N/A	N/A
Strength				
SPT N value ¹	3	15 ->100	63	73
SPT N ₆₀ value ¹	3	13 - >100	60	66
HSV (field), c _u ² (kPa)	21	34-56	43	44
Compaction				
Plate Load Test, CBR (%)	1	1.74	1.74	1.74

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Lab CBR (%)		8 (4)	0.49-1.9	0.9	0.7
Compaction	Maximum dry density (Mg/m ³)	2	1.71-1.83	1.77	1.77
	OMC (%)	2	16.5-19.5	18	18
MCV from MCC (multi-point)		5 (1)	4-11.2	N/A	N/A
MCV (at NMC)		2	5.9-6.8	6.35	6.35
<p>¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.3-4 for full extrapolated values.</p> <p>² HSV results are measured values and have not been corrected.</p>					

Glacial Deposits – Granular

- 4.5.9 Granular Glacial Deposits were recorded in three locations in the 2021 ground investigation. In BH BB015 and BH BB016 it was encountered from ground level to a depth up to 0.3m bgl and was described as very clayey slightly gravelly sand with many rootlets, a description consistent with Topsoil or cultivated ground.
- 4.5.10 In TP BB008 very clayey very sandy gravel was recorded from 1.1 to 1.6m bgl, above the mudstone bedrock. The gravel was composed of mudstone.
- 4.5.11 The 2021 ground investigation did not record Granular Glacial Deposits in this section of the Scheme 7 apart from shallow material at depths shallower than 0.3m bgl and a layer of “*very clayey very sandy gravel*” from 1.1 to 1.6m bgl in TP BB008. In general no significant thicknesses of granular material are anticipated along this section of the scheme.

Table 4.5-5: Section 7.3 – In-situ and Laboratory Test Results for Glacial Deposits - Granular

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Compaction					
MCV (at NMC)		1	6.9	6.9	6.9

Mudstone (Stainmore Formation)

- 4.5.12 Mudstone was recorded in several exploratory hole locations from the 2021 and historical ground investigations.
- 4.5.13 BH BB015 and BH BB016, both cable percussion boreholes, terminated within weathered mudstone. In BH BB015 a significant thickness of weathered material described as ‘*firm to stiff slightly sandy very gravelly clay/ clayey gravel*’ was encountered from 1.85m bgl to the base of the hole at 5.1m bgl. In BH BB016, weathered mudstone with a similar description was encountered at 0.9m bgl until refusal at 2.4m bgl.
- 4.5.14 TP BB008 and TP BB009 both encountered distinctly weathered mudstone recovered as gravel at 1.6 and 2.6m bgl respectively. Historical holes also recorded mudstone at depths as shallow as 0.6m bgl (NZ01SW16).
- 4.5.15 BH BB018 recorded interbedded partially weathered mudstone, siltstone and sandstone between 11.4m bgl and 15m bgl, beneath approximately 10m of limestone.

Table 4.5-6: Section 7.3 – In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	2	2.50-2.59	2.55	2.55
Natural Moisture Content (%)	6	12-27	19.8	20
Liquid Limit (%)	4	24-40	33	35
Plastic Limit (%)	4	16-22	20	21
Plasticity Index (%)	4	8-18	14	14
PSD	2	N/A	N/A	N/A
Strength				
SPT N Value ¹	6	17 - >100	65	68
SPT N ₆₀ Value ¹	6	15 - >100	61	60
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100.				

Limestone (Great Limestone Member)

- 4.5.16 Limestone was recorded from shallow depth in BH BB018. Mudstone and limestone gravel/ cobbles were present from 0.6m bgl with possible limestone boulders from 1.2m bgl for several metres. The precise level of the limestone rockhead was therefore uncertain. The limestone extends to a depth of 10.6m bgl and was typically described as medium strong dark grey fossiliferous and partially weathered. Some clay bands were also present.
- 4.5.17 Limestone was also recorded in historical borehole NZ01SW58. Strong to very strong limestone was reported from 1.2m bgl to the base of the hole at 6.2m bgl.

Table 4.5-7: Section 7.3 – In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	1	26.05	26.05	26.05
Natural Moisture Content (%)	1	7.1	7.1	7.1
PSD	1	N/A	N/A	N/A
Strength				
Rock water content (%)	3	0.2-0.4	0.3	0.3
UCS (MPa)	1	49.6	49.6	49.6
Point Load Index	30	2.3-8.2	5.177	5.1
Compaction				
Lab CBR (%)	2 (1)	3.8-5.1	4.5	4.5
MCV (at NMC)	1	6.9	6.9	6.9

Sandstone (Alston Formation)

4.5.18 Sandstone was recorded at the base of the limestone in BH BB018 from 10.6 to 11.4m bgl and was described as moderately weak and partially weathered. The interbedded mudstone, siltstone and sandstone described above was present beneath.

Groundwater

4.5.19 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 4.5-8.

4.5.20 Where piezometers were installed, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 and a further round on 27 August 2021. Groundwater information is provided in Table 4.5-9 below and Figure 7-21.

Table 4.5-8: Section 7.3 – Groundwater Strikes Information

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH BB015	4.4	282.8	3.4	283.9	20	Glacial Deposits – Cohesive	
BH BB018	1.2	270.2	0.7	270.7	20	Limestone	Moderate inflow
NZ01SW16	1	283.9				Mudstone	

Table 4.5-9: Section 7.3 – Groundwater Monitoring Information

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB015	2.00m 19mm SPIE	1.5 (285.7)	1.5 (285.7)	Dry	Dry	Damp	Dry	Glacial Deposits – Cohesive	-
BH BB016	2.00m 19mm SPIE	Dry	Dry	Dry	Dry	Dry	N/A	Glacial Deposits - Cohesive	-
BH BB018	4.50m 19mm SPIE	3.9 (267.5)	3.9 (267.6)	4.0 (267.4)	4.1 (267.3)	3.9 (267.5)	N/A	Limestone	“Could not locate” for Round 6

4.5.21 One groundwater monitoring installation was located within the bedrock in BH BB018. The water levels within the installation stabilised at approximately 4m bgl. This is several metres below the level limestone was first recorded however the top 3m of limestone were described as possible boulders and therefore the rockhead is uncertain. It is noted that a water strike was recorded at 1.2m bgl in this location, rising to 0.7m bgl after 20 minutes and therefore groundwater is likely to be present above the level recorded in the installation. One water strike was recorded in mudstone at 1m bgl in historical borehole NZ01SW16.

4.5.22 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.

- 4.5.23 A groundwater strike was recorded at 4.4m bgl in weathered mudstone in BH BB015, rising to 3.4m bgl after 20 minutes. A groundwater installation at 2m bgl in the same borehole recorded water levels stable at 1.5m bgl for the first two rounds of monitoring before becoming dry. The installation at BH BB016 within weathered mudstone at 2m bgl was recorded as dry in each round of monitoring.
- 4.5.24 Combined drains and kerbs are present along the existing carriageway and a combination of cut-off ditches and filter drains are proposed at the top of the cuttings to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 4.5.25 The available information indicates that groundwater levels within the bedrock are at approximately rockhead level, possibly within weathered material or boulders around rockhead level. For the purposes of geotechnical design groundwater levels should be assumed to be at rockhead level, however, the presence of perched water in the superficial deposits should not be discounted.

4.6 Section 7.4 - Blacklodge Farm Underpass to end of scheme

- 4.6.1 Exploratory holes relevant to this section are given in Table 4.6-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
- Topsoil
 - Made Ground
 - Glacial Deposits – cohesive
 - Glacial Deposits – granular
 - Mudstone
 - Sandstone
 - Limestone

Table 4.6-1: Section 7.4 – Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Durham County Council, 1974 (British Geological Survey)	NZ01SW10	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW11	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW12	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW13	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NZ01SW17	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NZ01SW18	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NZ01SW19	Cable percussive borehole
Durham County Council, 1975 (British Geological Survey)	NZ01SW22	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW4	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW5	Cable percussive borehole
Durham County Council, 1979 (British Geological Survey)	NZ01SW58	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW6	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW7	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW8	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW9	Cable percussive borehole

Source/Date	Borehole ID	Type
Allied Exploration Geotechnics Ltd, 2021.	BH BB018	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB019	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB020	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB021	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB022	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB023	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB024	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB025	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB026	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	WS BB001	Window sample borehole
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP BB010	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB011	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB012	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB013	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB014	Trial Pit

Topsoil

- 4.6.2 Topsoil up to 0.5m thick was recorded in seven locations from the 2021 ground investigation and 14 locations from historical exploratory holes. It was typically described as soft dark brown sandy slightly gravelly clay with many rootlets.
- 4.6.3 In addition, historical location NZ01SW12 recorded material described as 'peat with dark reddish brown clay – highly organic' from 0.17 to 0.54m bgl. TP BB0012 recorded slightly peaty slightly sandy organic silt within material described as topsoil.
- 4.6.4 A summary of testing data available for Topsoil is presented in Table 4.6-2, graphical data are presented as figures where applicable.

Table 4.6-2: Section 7.4 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.5	2.5	2.5
Natural Moisture Content (%)	2	55-77	66	66
Liquid Limit (%)	2	72-82	77	77

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Plastic Limit (%)	2	41-42	41.5	41.5
Plasticity Index (%)	2	31-40	35.5	35.5
PSD	2	N/A	N/A	N/A

Made Ground

- 4.6.5 Made Ground was recorded in two locations from the 2021 ground investigation. In BH BB018, close to the existing underpass, granular Made Ground was present and comprised of sandy gravel of macadam, mudstone and limestone from ground level to 0.4m bgl and gravel and cobbles of mudstone and limestone to 0.6m bgl. TP BB011 recorded very clayey very sandy gravel from 0.15 to 0.8m bgl, anthropogenic material included plastic, ceramic tile fragments, brick and macadam.
- 4.6.6 A summary of testing data available for Made Ground is presented in Table 4.6-3, graphical data are presented as figures where applicable.

Table 4.6-3: Section 7.4 - In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	1	22	22	22
Liquid Limit (%)	1	40	40	40
Plastic Limit (%)	1	21	21	21
Plasticity Index (%)	1	19	19	19
PSD	1	N/A	N/A	N/A
Strength				
HSV (field), cu ¹ (kPa)	3	46-49	47	46
¹ HSV results are measured values and have not been corrected.				

Glacial Deposits – Cohesive

- 4.6.7 Cohesive Glacial Deposits form the major superficial material across the site and were encountered at ground level or beneath Topsoil to a maximum recorded depth of 17m bgl in BH BB023, where limestone bedrock was encountered at this depth.
- 4.6.8 The Cohesive Glacial Deposits were typically described as brown or grey, firm or firm to stiff (occasionally soft, soft to firm or stiff), slightly sandy slightly gravelly clay, with cobbles and occasionally boulders. The presence and proportion of the granular constituents were variable. The deposits are shown to increase in strength with depth, becoming stiff at approximately 3m bgl.
- 4.6.9 Gravel was typically described as fine to medium or fine to coarse, subangular to subrounded of sandstone, mudstone and limestone. Cobbles were also subangular to subrounded or rounded of mudstone, sandstone and limestone. Boulders were limestone, sandstone and mudstone.

Table 4.6-4: Section 7.4 - In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle density (Mg/m ³)		4	2.63-2.66	2.65	2.65
Bulk Unit Weight (kN/m ³)		7	18.74-22.56	20.78	20.40
Natural Moisture Content (%)		73	6-86	21	18
Liquid Limit (%)		87	24-66	37	36
Plastic Limit (%)		87	10-32	16	16
Plasticity Index (%)		87	10-44	20	20
PSD		12	N/A	N/A	N/A
Strength					
SPT N value ¹		38	10 - >100	59	48
SPT N ₆₀ value ¹		38	9 - >100	58	46
Unconsolidated Undrained Triaxial c _u (kPa)		2	14-27	21	21
HSV (lab), c _u ² (kPa)		1	29	29	29
HSV (field), c _u ² (kPa)		33	18-120	43	36
Consolidated Undrained Triaxial Tests	ϕ _{peak} (°)	1	27	27	27
	c' _{peak} (kPa)	1	7	7	7
Compaction					
Plate Load Test, CBR (%)		3	0.83-2.65	1.84	2.05
Lab CBR (%)		6 (3)	0.79-1.2	1	1
Compaction	Maximum dry density (Mg/m ³)	3	1.98-2.1	2.04	2.04
	OMC (%)	3	9-11.5	10.17	10
MCV from MCC (multi-point)		15 (3)	4.7-14.4	N/A	N/A
Compressibility and consolidation					
Oedometer Test @100kPa	m _v (m ² /MN)	4	0.25-0.42	0.35	0.37
	C _v (m ² /yr)	4	3-5.27	4.22	4.30
<p>¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.4-4 for full extrapolated values.</p> <p>² One sample exceeded the device measuring range of 120kPa. A value of 120kPa has been used for calculation of the statistics in this table. HSV results are measured values and have not been corrected.</p>					

Glacial Deposits – Granular

- 4.6.10 Granular Glacial Deposits were recorded in seven locations from the 2021 ground investigation and three historical locations. In four of these locations the material was encountered at ground level to a maximum depth of 0.4m bgl with a description consistent with Topsoil.
- 4.6.11 In BH BB020, material described as a very gravelly clay/ clayey gravel was present from 3.7 to 5.5m bgl, above the mudstone bedrock. In BH BB021 material described as medium dense very clayey sandy gravel was present from 1.4 to 2.8m bgl, Cohesive Glacial Deposits were present above and below. In TP BB014 a 0.3m band of very clayey very sandy gravel was present at 1.6m bgl, within otherwise Cohesive Glacial Deposits.
- 4.6.12 In historical locations where the presence of granular material was indicated (NZ01SW10, NZ01SW12, NZ01SW13) material described as sand/ gravel in a silty clay binder has been interpreted as granular.

Table 4.6-5: Section 7.4 - In-situ and Laboratory Test Results for Glacial Deposits - Granular

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	5	22-37	30	32
Liquid Limit (%)	3	28-60	41	34
Plastic Limit (%)	2	15-18	17	17
Plasticity Index (%)	3	10-42	24	19
PSD	1	N/A	N/A	N/A
Strength				
SPT N value ¹	1	20	-	-
SPT N ₆₀ value ¹	1	18	-	-
¹ For SPT N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.4-4 for full extrapolated values.				

Limestone (Great Limestone Member/Alston Formation)

- 4.6.13 Along the western chainages limestone was recorded from shallow depth in BH BB018 and in historical borehole NZ01SW58 from 1.2m bgl to the base of the hole at 6.2m bgl. This is interpreted to be part of the Great Limestone Formation. In BH BB018 mudstone and limestone gravel/ cobbles were present from 0.6m bgl with possible limestone boulders from 1.2m bgl for several metres. The precise level of the limestone rockhead is therefore uncertain. The limestone extended to a depth of 10.6m bgl and was typically described as medium strong dark grey fossiliferous and partially weathered. Some clay bands were also present.
- 4.6.14 Along the eastern end limestone was also recorded in BH BB023 at 17m bgl to the base of the hole at 17.6m bgl, and in BH BB024 at 13m to 18.5m bgl, beneath Cohesive Glacial Deposits in both locations. Historical holes NZ01SW6 and NZ01SW8 also recorded limestone at greater depth, 11.2 to 13.8m bgl and 15.6 to 16.3m bgl respectively underlying mudstone. This is interpreted to be part of the Alston Formation.

Table 4.6-6: Section 7.4 - In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	3	24.27-26.05	25.08	24.93
Natural Moisture Content (%)	1	7.1	-	-
PSD	1	N/A	N/A	N/A
Strength				
SPT N value ¹	1	>100	-	-
SPT N ₆₀ value ¹	1	>100	-	-
Rock water content (%)	4	0.2-1.3	0.55	0.35
UCS (MPa)	3	20.1-49.6	32.333	27.3
Point Load Index	59	1.6-8.2	4.842	4.9
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 7.4-4 for full extrapolated values.				

Mudstone (Alston Formation)

4.6.15 BH BB018 recorded interbedded partially weathered mudstone, siltstone and sandstone between 11.4m bgl and 15m bgl, beneath approximately 10m of limestone. In BH BB019 the borehole terminated on possible rockhead at 3m bgl. BH BB020 recorded weak to moderately weak partially weathered mudstone from 5.5 to 15m bgl.

4.6.16 Historical location NZ01SW13 appears to record weathered mudstone from 3.1 to 6m bgl. Two other locations NZ01SW6 and NZ01SW6 recorded mudstone at greater depth from 8.6 to 11.2m bgl and 13 to 15.6m bgl respectively.

Table 4.6-7: Section 7.4 - In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	3	10-16	12	10
Liquid Limit (%)	3	32-38	36	37
Plastic Limit (%)	3	15	15	15
Plasticity Index (%)	3	17-23	21	22
Strength				
SPT N value ¹	1	44	-	-
SPT N ₆₀ value ¹	1	40	-	-
Rock water content (%)	1	2.9	2.9	2.9
Point Load Index	17	0.3-4.7	1.347	0.8

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 7.4-4 for full extrapolated values.				

Sandstone (Alston Formation)

4.6.17 Sandstone was recorded at the base of the limestone in BH BB018 from 10.6 to 11.4m bgl and was described as moderately weak and partially weathered. The interbedded mudstone, siltstone and sandstone described above was present beneath.

4.6.18 Sandstone was also recorded in BH BB024 from 18.5m bgl to the base of the hole at 20.3m bgl, beneath the overlying limestone.

Table 4.6-8: Section 7.4 - In-situ and Laboratory Test Results for Sandstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Point Load Index	10	2.3-3.7	2.85	2.75

Groundwater

4.6.19 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 4.6-9.

4.6.20 Where piezometers were installed, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 with a further round on 27 August 2021. Groundwater information is provided in Table 4.6-10 below and Figure 7-21.

Table 4.6-9: Section 7.4 – Groundwater Strikes Information

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH BB018	1.2	270.2	0.7	270.7	20	Limestone	Moderate inflow
BH BB021	1.7	262.8	0.5	263.9	20	Glacial Deposits – Cohesive	Fast inflow
TP BB010	1.2	263.9				Glacial Deposits – Cohesive	Moderate inflow
TP BB010	2.6	262.5				Glacial Deposits – Cohesive	Moderate inflow
TP BB011	3.3	262.6				Glacial Deposits – Cohesive	Moderate inflow
TP BB014	1.6	260.0				Glacial Deposits – Granular	
NZ01SW10	1.68	262.09				Glacial Deposits – Cohesive	

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
NZ01SW11	1.75	262.03				Glacial Deposits – Cohesive	
NZ01SW12	1.64	263.4	0.84	264.2	10	Glacial Deposits – Granular	
NZ01SW13	1.19	265.18	1.19	265.18	0	Glacial Deposits – Cohesive	
NZ01SW13	5.9	260.47	5.27	261.1	5	Mudstone	
NZ01SW17	3	259.58	2.89	259.69	15	Glacial Deposits – Cohesive	
NZ01SW18	1.6	260.41				Glacial Deposits – Cohesive	
NZ01SW22	1.4	266.64				Glacial Deposits – Cohesive	
NZ01SW4	1.17	262.15				Glacial Deposits – Cohesive	
NZ01SW7	0.65	264.19				Glacial Deposits – Cohesive	

Table 4.6-10: Section 7.4 – Groundwater Monitoring Information

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB018	4.50m 19mm SPIE	3.9 (267.5)	3.9 (267.6)	4.0 (267.4)	4.1 (267.3)	3.9 (267.5)	N/A	Limestone	“Could not locate” for Round 6
BH BB022	3.00m 19mm SPIE	0.5 (261.9)	0.4 (262.0)	0.7 (261.6)	0.8 (261.6)	0.7 (261.6)	N/A	Glacial Deposits – Cohesive	“Could not locate” for Round 6
BH BB023	6.00m 19mm SPIE	1.0 (264.5)	1.0 (264.5)	1.4 (264.0)	1.4 (263.9)	1.5 (264.0)	2.8 (262.6)	Glacial Deposits – Cohesive	-
BH BB024	2.00m 19mm SPIE	1.3 (262.8)	1.3 (262.8)	1.5 (262.6)	1.5 (262.6)	1.3 (262.8)	1.8 (262.3)	Glacial Deposits - Cohesive	-
BH BB025	2.00m 19mm SPIE	0.2 (262.7)	0.3 (262.7)	0.3 (262.6)	0.3 (262.7)	N/A	N/A	Glacial Deposits - Cohesive	“Could not locate” for Round 6

- 4.6.21 One groundwater monitoring installation was located within the bedrock in BH BB018. The water levels within the installation stabilised at approximately 4m bgl. This is several metres below the level limestone was first recorded, however, the top 3m of limestone were described as possible boulders and therefore the rockhead is uncertain. It is noted that a water strike was recorded at 1.2m bgl in this location, rising to 0.7m bgl after 20 minutes and therefore groundwater is likely to be present above the level recorded in the installation. A water strike was also recorded in historical borehole NZ01SW13 at 5.9m bgl within weathered mudstone.
- 4.6.22 Four installations were located in the Cohesive Glacial Deposits around the proposed location of the East Bowes Accommodation Overpass, at depths between 2 and 6m bgl. Each of the four installations recorded stabilised groundwater levels between approximately 0.3 and 1.5m bgl indicating possible perched water.
- 4.6.23 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 4.6.24 14 water strikes were recorded within Cohesive Glacial Deposits in this section of the scheme. The depth of the strikes ranged from 0.65m bgl (NZ01SW7) to 3.3m bgl (TP BB011).
- 4.6.25 Combined drains and kerbs are present along the existing carriageway and a combination of cut-off ditches and filter drains are proposed at the toe of the north embankment to the east of Blacklodge underpass and along the top of the cuttings to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 4.6.26 For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level.

4.7 Section 7.5 - East Bowes Accommodation Overpass

- 4.7.1 Exploratory holes relevant to this section are given in Table 4.7-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
 - Topsoil
 - Glacial Deposits – cohesive
 - Glacial Deposits – granular
 - Mudstone
 - Sandstone
 - Limestone

Table 4.7-1: Section 7.5 – Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Durham County Council, 1974 (British Geological Survey)	NZ01SW22	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW4	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW5	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW6	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW7	Cable percussive borehole
Durham County Council, 1974 (British Geological Survey)	NZ01SW8	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB022	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB023	Cable percussive borehole & rotary core follow on
Allied Exploration Geotechnics Ltd, 2021.	BH BB024	Cable percussive borehole & rotary core follow on

Source/Date	Borehole ID	Type
Allied Exploration Geotechnics Ltd, 2021.	BH BB025	Cable percussive borehole
Allied Exploration Geotechnics Ltd, 2021.	BH BB026	Cable percussive borehole
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP BB012	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP BB013	Trial Pit

Topsoil

- 4.7.2 Topsoil up to 0.5m thick was recorded in two locations in the 2021 ground investigation and five locations from historical exploratory holes. TP BB0012 recorded slightly peaty slightly sandy organic silt within this material.
- 4.7.3 A summary of testing data available for Topsoil is presented in Table 4.7-2, graphical data are presented as figures where applicable.

Table 4.7-2: Section 7.5 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	1	55	55	55
Liquid Limit (%)	1	72	72	72
Plastic Limit (%)	1	41	41	41
Plasticity Index (%)	1	31	31	31
PSD	1	N/A	N/A	N/A

Glacial Deposits – Cohesive

- 4.7.4 Cohesive Glacial Deposits form the major superficial material across the site and were encountered at ground level or beneath Topsoil to a maximum recorded depth of 17m bgl in BH BB023, where limestone bedrock was encountered at this depth.
- 4.7.5 The Cohesive Glacial Deposits were typically described as brown or grey, firm or firm to stiff (occasionally soft to firm or stiff), slightly sandy slightly gravelly clay, with cobbles and occasionally boulders. The presence and proportion of the granular constituents were variable. The deposits are shown to increase in strength with depth, becoming stiff at approximately 2m bgl.
- 4.7.6 Gravel was typically described as fine to medium or fine to coarse, subangular to subrounded of sandstone, mudstone and limestone. Cobbles were also subangular to subrounded or rounded of mudstone, sandstone and limestone. Boulders were limestone, sandstone and mudstone.

Table 4.7-3: Section 7.5 - In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle density (Mg/m ³)		2	2.63-2.66	2.65	2.65
Bulk Unit Weight (kN/m ³)		2	19.91-22.17	21.04	21.04
Natural Moisture Content (%)		33	8.2-86	21	18
Liquid Limit (%)		45	24-66	38	37
Plastic Limit (%)		45	10-32	17	15
Plasticity Index (%)		45	12-44	21	20
PSD		7	N/A	N/A	N/A
Strength					
SPT N value ¹		30	18 - >100	63	52
SPT N ₆₀ value ¹		30	16 - >100	62	51
Unconsolidated Undrained Triaxial c _u (kPa)		1	27	27	27
HSV (lab), c _u (kPa) ²		1	29	29	29
HSV (field), c _u (kPa) ²		5	26-38	34	36
Compaction					
Plate Load Test, CBR (%)		2	2.05-2.65	2.35	2.35
Lab CBR (%)		2 (1)	1-1.2	1.1	1.1
Compaction	Maximum dry density (Mg/m ³)	1	2.1	2.1	2.1
	OMC (%)	1	9	9	9
MCV from MCC (multi-point)		5 (1)	4.7-10.7	N/A	N/A
Compressibility and consolidation					
Oedometer Test @100kPa	m _v (m ² /MN)	2	0.344-0.4	0.37	0.37
	C _v (m ² /yr)	2	4.6-5.27	4.9	4.9
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7.5-4 for full extrapolated values. ² HSV results are measured values and have not been corrected.					

Glacial Deposits – Granular

- 4.7.7 Granular Glacial Deposits were recorded in four locations from the 2021 ground investigation. In each of these locations it was present from ground level to a maximum depth of 0.4m bgl. The material was described as a very clayey slightly gravelly sand with many rootlets, consistent with Topsoil or cultivated material.
- 4.7.8 No in-situ nor laboratory tests were carried out on Granular Glacial Deposits in section 7.5.

Mudstone (Alston Formation)

4.7.9 Mudstone was only recorded in historical exploratory holes in this section of the scheme. NZ01SW6 and NZ01SW8 recorded mudstone 8.6 to 11.2m bgl and 13 to 15.6m bgl respectively, beneath Cohesive Glacial Deposits and overlying the limestone beneath.

Limestone (Alston Formation)

4.7.10 Limestone was recorded in BH BB023 at 17m bgl to the base of the hole at 17.6m bgl, and in BH BB024 at 13m to 18.5m bgl, beneath Cohesive Glacial Deposits in both locations. Boreholes NZ01SW6 and NZ01SW8 recorded limestone at, 11.2 to 13.8m bgl and 15.6 to 16.3m bgl respectively underlying mudstone.

Table 4.7-4: Section 7.5 - In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	2	24.27-24.73	24.60	24.60
Strength				
SPT N and N ₆₀ value ¹	1	>100	-	-
Rock Water Content (%)	1	1.3	1.3	1.3
UCS (MPa)	2	20.1-27.3	23.7	23.7
Point Load Index	29	1.6-7.7	4.497	4.5
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 7.5-4 for full extrapolated values.				

Sandstone (Alston Formation)

4.7.11 Sandstone was recorded in BH BB024 from 18.5m bgl to the base of the hole at 20.3m bgl, beneath the overlying limestone.

Table 4.7-5: Section 7.5 - In-situ and Laboratory Test Results for Sandstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Point Load Index	10	2.3-3.7	2.85	2.75

Groundwater

4.7.12 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 4.7-6.

4.7.13 Where piezometers were installed, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 and a further round on the 27 August 2021. Groundwater information is provided in Table 4.7-7 below and Figure 7-21.

Table 4.7-6: Section 7.5 – Groundwater Strikes Information

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
NZ01SW4	1.17	262.15				Glacial Deposits – Cohesive	
NZ01SW7	0.65	264.19				Glacial Deposits – Cohesive	

Table 4.7-7: Section 7.5 – Groundwater monitoring information

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH BB022	3.00m 19mm SPIE	0.5 (261.9)	0.4 (262.0)	0.7 (261.6)	0.8 (261.6)	0.7 (261.6)	N/A	Glacial Deposits – Cohesive	“Could not locate” for Round 6
BH BB023	6.00m 19mm SPIE	1.0 (264.5)	1.0 (264.5)	1.4 (264.0)	1.4 (263.9)	1.5 (264.0)	2.8 (262.6)	Glacial Deposits – Cohesive	-
BH BB024	2.00m 19mm SPIE	1.3 (262.8)	1.3 (262.8)	1.5 (262.6)	1.5 (262.6)	1.3 (262.8)	1.8 (262.3)	Glacial Deposits - Cohesive	-
BH BB025	2.00m 19mm SPIE	0.2 (262.7)	0.3 (262.7)	0.3 (262.6)	0.3 (262.7)	N/A	N/A	Glacial Deposits - Cohesive	“Could not locate” for Round 6

- 4.7.14 Four installations were located in the Cohesive Glacial Deposits around the proposed location of the East Bowes Accommodation Overpass, at depths between 2 and 6m bgl. Each of the four installations recorded stabilised groundwater levels between approximately 0.3 and 1.5m bgl indicating possible perched water.
- 4.7.15 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 4.7.16 Two water strikes were recorded within Cohesive Glacial Deposits in this section of the scheme. The depth of the strikes ranged from 0.65m bgl (NZ01SW7) to 1.17m bgl (NZ01SW4).
- 4.7.17 Combined drains and kerbs are present along the existing carriageway and a combination of cut-off ditches and filter drains are proposed to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 4.7.18 From the available groundwater strikes information and monitoring data it is recommended that for the purposes of geotechnical design, groundwater levels should be assumed to be at or near to ground level in this part of the scheme.

4.8 Scheme 7 Geotechnical Parameters

- 4.8.1 This section of the report presents geotechnical site-wide parameters derived for the purpose of developing a suitable specimen design. The parameters are summarised within Table 4.8-8. These should be treated as preliminary and should be given further consideration during the PCF design stage 4. The rationale for determination of geotechnical parameters is explained below:

- For earthworks cuttings, stability considerations are paramount and assessment of shear strength parameters is required.
- For earthworks embankments, in addition to shear strength parameters and compressibility of the embankment material itself, similar properties of the soil below the proposed foundation level are required. Further, the materials used for embankment construction must be workable and compliant with the current Specification for Highway Works.
- For structure foundations, the compressibility characteristics and bearing capacity are primary concerns.

4.8.2 Geotechnical parameters for the strata encountered in exploratory holes located along the scheme have been derived from laboratory tests, literature sources and soil and rock descriptions. The methodologies used to derive these are outlined in Appendix B.

Topsoil

4.8.3 A summary of site-wide laboratory and in-situ data available for Topsoil is presented in Table 4.8-1. As Topsoil is not an engineering material, material properties have not been derived for this stratum.

Table 4.8-1: Scheme 7 – In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	3	2.45-2.52	2.49	2.50
Natural Moisture Content (%)	6	27-77	47	38.5
Liquid Limit (%)	5	38-82	58	53
Plastic Limit (%)	5	32-42	38	38
Plasticity Index (%)	5	0-40	21	18
PSD	4	N/A	N/A	N/A

Made Ground

4.8.4 A summary of site-wide laboratory and in-situ data available for Made Ground is presented in Table 4.8-2. As Made Ground is not an engineering material, material properties have not been derived for this stratum.

Table 4.8-2: Scheme 7 – In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.64	-	-
Natural Moisture Content (%)	8	8-60	33	29
Liquid Limit (%)	3	22-40	33	36
Plastic Limit (%)	3	12-21	18	21
Plasticity Index (%)	3	10-19	14.7	15
PSD	7	N/A	N/A	N/A

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Strength				
SPT N and N ₆₀ value ¹	1	22	-	-
HSV (field), c _u (kPa) ²	3	46-49	47	46
Compaction				
MCV from MCC (multi-point)	5 (1)	4.6-13.8	N/A	N/A
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100.				
² HSV results are measured values and have not been corrected.				

Glacial Deposits – Cohesive

4.8.5 A summary of site-wide laboratory and in-situ data available for the Cohesive Glacial Deposits is presented in Table 4.8-3. Ground parameters are discussed below.

Table 4.8-3: Scheme 7 – In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results	No. of tests	Range	Mean	Median	
Classification					
Particle density (Mg/m ³)	16	2.54-2.67	2.63	2.65	
Bulk Unit Weight (kN/m ³)	35	17.17-22.56	20.25	20.40	
Natural Moisture Content (%)	250	6-92	20	18	
Liquid Limit (%)	271	17-93	36	35	
Plastic Limit (%)	271	8-59	17	16	
Plasticity Index (%)	271	0-44	19	19	
PSD	35	N/A	N/A	N/A	
Strength					
SPT N value ¹	68	6 - >100	53	41	
SPT N ₆₀ value ¹	68	6 - >100	51	37	
UU, c _u (kPa)	3	14-56	32	27	
HSV (lab), c _u (kPa) ²	3	27-80	45	29	
HSV (field), c _u (kPa) ²	102	18-120	47	41	
Consolidated Undrained Triaxial Tests	ϕ ¹ _{peak} (°)	2	27-32	30	30
	c ¹ _{peak} (kPa)	2	1-7	4	4
Direct shear test	ϕ ¹ _{peak} (°)	7	24-33	29	29
	c ¹ _{peak} (kPa)	7	0-18	6	6
Compaction					

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Plate Load Test, CBR (%)		6	0.8 – 2.7	1.9	2.0
Lab CBR (%)		24 (12)	0.49-5.1	1.4	1.1
Compaction	Maximum dry density (Mg/m ³)	16	1.71-2.15	1.97	1.97
	OMC (%)	16	7-19.5	11.94	11.5
MCV from MCC (multi-point)		70 (14)	2.6-16.6	N/A	N/A
MCV (at NMC)		11	0.8-10.6	6.0	6.8
Compressibility and consolidation					
Oedometer Test @100kPa	m _v (m ² /MN)	4	0.25-0.42	0.35	0.37
	C _v (m ² /yr)	4	3-5.27	4.22	4.30
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. ² HSV results are measured values and have not been corrected.					

Classification

- 4.8.6 The bulk unit weight results indicate a typical value of 20 to 21kN/m³ for Cohesive Glacial Deposits across scheme 7. A value of 21kN/m³ is proposed considering these results, and with reference to guidance for similar materials in BS8002:2015 [38].
- 4.8.7 The A line plot shows that the majority of the material within this stratum is clay of low or intermediate plasticity. The natural moisture content values plotted with Atterberg limits show that this was typically close to the plastic limit. Shallower samples from less than 1m bgl recorded higher natural moisture content, closer to the liquid limit. Of note, several samples from historical holes did not have moisture content with the Atterberg limit tests.
- 4.8.8 PSD tests carried out in this stratum recorded a median clay and silt content of 43% and a median sand and gravel content of 56.5%. Cobbles and boulders content up to 28% was recorded in 3 samples, although coarse granular material is likely to be more prevalent in-situ than in recovered samples.
- 4.8.9 The median recorded particle density of 2.65 is considered appropriate for this stratum.

Shear strength

- 4.8.10 Of the 69 SPT tests completed, 22 did not reach full penetration with N values derived by extrapolation. It is likely that the majority of these tests were hindered by obstructions such as cobbles or boulders. Therefore, results extrapolated over 100 have not been used to derive material properties for this stratum.
- 4.8.11 Measured SPT values N have been corrected for energy losses, based on the reported hammer energy ratio, giving N₆₀ values. A 60% ratio has been assumed for historical holes.
- 4.8.12 SPT N₆₀ values are shown to increase with depth from 10 at approximately 3m bgl to 50 at 16m bgl. See Figure 7-6. A similar trend is observed on undrained shear strength, see Figure 7-7. Lower N₆₀ values ranging between approximately 6-20 were encountered frequently at shallow depth (<3m bgl) and along boreholes within section 7.1.
- 4.8.13 For the sections under this scheme, the median Plasticity Index (PI) ranged between 17% and 22%, which gives f₁ between 5.5 and 6.3 according to Stroud (1975) [41]. Using a more typical value of 4.5 this corresponds to a c_u of approximately 40kPa for shallower material (<3m bgl), 100kPa at 3m bgl gradually increasing to 225kPa at 16m bgl.

- 4.8.14 Average hand shear vane results indicate a peak undrained shear strength of approximately 40kPa at shallow depth although some material with c_u around or above 120kPa was recorded. Three unconsolidated undrained triaxial tests carried out at depths between 1.5 and 3m bgl recorded an average c_u of approximately 30kPa.
- 4.8.15 A limited number of U100 samples were recovered due to the granular content within the Glacial Deposits.
- 4.8.16 The effective friction angle at a constant volume, $\phi'_{cv} = 26^\circ$, has been derived according to BS8002:2015 [38] based on a PI of 19%.
- 4.8.17 Seven small shearbox tests were carried out on recompacted clay samples, predominantly in firm to stiff strata. A median reported effective friction angle of $\phi'_{pk} = 29^\circ$. Two consolidated undrained triaxial tests were carried out and recorded effective friction angles of 27° and 32° , an average of 29.5° .
- 4.8.18 The peak effective friction angle $\phi'_{pk} = 27^\circ$, is recommended based on the results of shearbox and consolidated undrained triaxial testing.
- 4.8.19 The effective cohesion recorded from small shearbox and consolidated undrained triaxial testing ranged from 0 to 18 kPa. $c' = 0\text{kPa}$ is considered appropriate for this stratum.

Consolidation and Compressibility/ Stiffness

- 4.8.20 Four oedometer tests have been carried out on samples from depths of 1.2 to 3m bgl with loading/unloading increments particular to the in-situ conditions and proposed embankment heights. m_v values from the 50-100kPa loading increment have been reported in the summary tables as this is typical of the surcharge from a low height embankment. A mean value of $m_v = 0.35\text{m}^2/\text{MN}$ has been derived. This represents a medium to high compressibility clay, and is typical for firm glacials.
- 4.8.21 The equation described in Appendix B has been used to derive a drained elastic modulus for this stratum as follows:
$$E' = 1/m_v = 2.9 \text{ MPa}$$
- 4.8.22 m_v can also be derived from SPT N_{60} value and plasticity index as discussed in Appendix B. It is noted that based on the median PI of 19% and the representative value of SPT $N_{60} = 10$ at shallow depth, this corresponds to $f_2 = 0.60$ and $m_v = 0.16\text{m}^2/\text{MN}$ and $E' = 6\text{MPa}$. Soil stiffness is anticipated to increase with depth as the SPT profile, with an E' of 30MPa estimated at 16 m bgl.
- 4.8.23 For larger strains associated with settlement/heave calculations a relationship of $E' = 250 \times c_u$ is also commonly adopted. This would result in $E' = 10\text{MPa}$ at shallow depth, increasing with depth below 4m bgl.
- 4.8.24 A value of $E' = 5\text{MPa}$ is considered appropriate at this stage from 0-3m bgl increasing to 30MPa at 16m bgl.

Compaction

- 4.8.25 Laboratory CBR tests were carried out on the top and bottom of 12 samples from the 2021 ground investigation, typical values of 1% – 1.5% were recorded. Due to the tests being carried out under soaked conditions, these values represent a lower bound to the in-situ conditions that will be encountered on the scheme.
- 4.8.26 Six in-situ Plate Load Tests were carried out at depths of 0.35 to 0.5m bgl. The equivalent CBR values derived from these tests ranged between 0.8 and 2.7%, with a median of 2.0%. As expected, these values are generally higher than those from laboratory CBR tests. The median value of 2.0% is considered representative of shallow material. Higher CBR values would be expected at greater depth.
- 4.8.27 Further consideration has been given to a potential relationship between CBR and plasticity index, as suggested in historical pavement design reference HD25/94 (DMRB, Volume 7, Section 2 Foundations). The derived plasticity index of 19% provides an indicative CBR value between 4 and 5%. The recorded in-situ CBRs are noted to be lower than the indicative

range provided in HD25/94 [39], however, only a limited number of in-situ CBRs were undertaken. Further consideration to subgrade improvement is recommended.

- 4.8.28 The average optimum moisture content from compaction tests was 12%, with the majority of values in the range of 9-15%. The average maximum dry density was 1.97 Mg/m³ (19.3kN/m³). This indicates that excavated material will be wet of optimum and will require drying or treatment before reuse.
- 4.8.29 The multi-point MCC (Moisture Condition Calibration) tests and single-point MCV test results show a clear correlation between MCV and moisture content. A value of MCV = 6 appears to be representative from the 11 single point MCV tests undertaken at natural moisture content, although it is noted that the specimens from bulk samples are likely to have dried to some extent prior to testing.
- 4.8.30 A line of best fit through a plot of all MCV results and moisture content (including single-point and multi-point test results) indicates that the OMC of 12% derived from compaction tests corresponds to an MCV of 10. It is noted that there is significant variability in the MCV test results at any given moisture content.

Glacial Deposits – Granular

- 4.8.31 A summary of laboratory and in-situ data available for the Granular Glacial Deposits is presented in Table 4.8-4. Ground parameters are discussed below.

Table 4.8-4: Scheme 7 – In-situ and Laboratory Test Results for Glacial Deposits - Granular

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	2	2.5-2.64	2.62	2.62
Bulk Unit Weight (kN/m ³)	1	21.68	21.68	21.68
Natural Moisture Content (%)	22	12-69	28	25.5
Liquid Limit (%)	18	28-60	37	35
Plastic Limit (%)	17	13-26	19	19
Plasticity Index (%)	18	10-42	18	16
PSD	5	N/A	N/A	N/A
Strength				
SPT N value ¹	13	4-35	17	15
SPT N ₆₀ value ¹	13	4-32	15	15
Direct shear test	ϕ' _{peak} (°)	1	28	28
	c' _{peak} (kPa)	1	3	3
Compaction				
Lab CBR (%)	2 (1)	0.21-0.27	0.24	0.24
MCV (at NMC)	1	6.9	6.9	6.9
¹ For SPT N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100.				

Classification

- 4.8.32 A single value of bulk unit weight of 21.68kN/m³ was reported. A value of 21kN/m³ is suggested in line with the results for Cohesive Granular Deposits from scheme 7 and guidance in BS8002:2015 [38].
- 4.8.33 22 moisture content tests were carried out in this stratum. Many were carried out at shallow depth in material with a description indicative of Topsoil. Those carried out in granular material at greater depth are unlikely to be representative of in-situ material.
- 4.8.34 It is noted that historical holes were not logged to modern standards and therefore it has not been possible to accurately distinguish between granular and cohesive strata. Where plasticity results are recorded it is possible that these are either results from the cohesive matrix of a predominantly granular soil or that the description has been interpreted as granular despite being a cohesive soil.
- 4.8.35 Five PSDs were carried out in this stratum. Sand and gravel content is recorded between 67% and 84% with the remaining material composed of clay and silt, apart from 6m bgl in BH BB005, which recorded a clay and silt content of 10% and cobbles and boulders content of 13%.
- 4.8.36 The median particle density recorded of 2.62 is considered appropriate for this stratum.

Shear strength

- 4.8.37 All SPT tests reached full penetration. The mixed glacial materials described as clayey have similar SPT N₆₀ values to the Cohesive Glacial Deposits, with some loose material present several metres thick in borehole BH BB005 (SPT N₆₀ values of 4, 6 and 8). Higher values of up to SPT N₆₀ = 32 are recorded at greater depth in more consistent granular material in BH BB005. There is a clear correlation between SPT N₆₀ value and depth. Suggested values are SPT N₆₀ = 10 from 0 to 5m bgl and SPT N₆₀ = 20 below 5m bgl.
- 4.8.38 One small shearbox test was carried out in material from a stratum described as medium dense grey very clayey sandy gravel at 3.5m bgl. This test recorded an effective friction angle of 28°, which is lower than typical for granular strata and is not considered representative, as coarse material would have been removed prior to testing.
- 4.8.39 The angle of shearing resistance has therefore been derived from SPT N₆₀ as below according to Peck et al. (1974) [42], Appendix B.
- $$\phi' = 30^\circ \text{ (0 to 5m bgl)}$$
- $$\phi' = 33^\circ \text{ (>5m bgl)}$$
- 4.8.40 The constant volume effective angle of shearing resistance has also been estimated according to the equation in BS8002:2015 [38], based on the angularity of particles and PSD results as follows:
- $$\phi'_{cv,k} = 30^\circ + \phi'_{ang} + \phi'_{PSD} = 36^\circ$$
- 4.8.41 The above has been derived based on angularity of particles typically sub-angular to sub-rounded and a uniformity coefficient of >6. As there are only five PSD results available in this stratum the values derived from SPTs are considered more representative and have been recommended as typical values.

Stiffness

- 4.8.42 SPT N values were used to derive E' in accordance with Stroud (1989) in CIRIA 143 [43] as follows:
- $$E' = 1 \times N_{60} = 10\text{MPa (0 to 5m bgl)}$$
- $$E' = 1 \times N_{60} = 20\text{MPa (>5m bgl)}$$

Compaction

- 4.8.43 One laboratory CBR test was carried out on a sample from 2m bgl in BH BB005. Both the top and bottom of the sample were tested and returned values of 0.21% and 0.27% due to the test being carried out under soaked conditions on a recompacted sample. These values

should not be relied upon and represent worst-case conditions. No in-situ plate load tests were carried out in this material.

- 4.8.44 One MCV test was carried out on a sample from 1.4m bgl in TP BB008. A value of 6.9 was recorded at a moisture content of 24%.

Mudstone

- 4.8.45 A summary of laboratory and in-situ data available for mudstone is presented in Table 4.8-5. Ground parameters are discussed below. It should be noted that the results have not been split between the Stainmore Formation present at the west of the scheme and the Alston Formation present to the east.

Table 4.8-5: Scheme 7 – In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	2	2.5-2.59	2.55	2.55
Bulk Unit Weight (kN/m ³)	3	24.36-25.40	25.04	25.37
Natural Moisture Content (%)	35	5-36	15	16
Liquid Limit (%)	25	24-63	35	36
Plastic Limit (%)	25	13-22	18	18
Plasticity Index (%)	25	8-23	17	17
PSD	3	N/A	N/A	N/A
Strength				
SPT N value ¹	39	8 - >100	80	>100
SPT N ₆₀ value ¹	39	10 - >100	78	>100
Rock water content (%)	9	2.9-6.1	4.7	4.9
UCS (MPa)	3	10.1-39.3	29.4	38.8
Point Load Index	125	0.1-10	1.4	0.6
1 For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 7-6 for full extrapolated values.				

Classification

- 4.8.46 Moisture content and Atterberg limits testing have been carried out on weathered mudstone. The median values recorded in Table 4.8-5 above are considered representative. The results reported include those recorded in historical boreholes. A bulk unit weight of 25kN/m³ is considered representative.

Strength

- 4.8.47 Of the 39 SPTs undertaken, 21 recorded extrapolated values over 100 on material described as weak grey mudstone, either partially or distinctly weathered.
- 4.8.48 Several SPTs that were recorded in broken mudstone where rotary drilling experienced poor recovery, reached full penetration, for example those in BH BB007 and BH BB014. Low SPT N₆₀ values of 19 were recorded in BH BB006 within weathered material and 10 at the boundary between soft clay and the weathered mudstone beneath in WS BB002. No representative values of SPT N value or shear strength parameters have been derived for the weathered

mudstone as conditions will be highly variable dependent on the thickness of weathered material at rockhead.

Rock Testing

- 4.8.49 The values of rock moisture content provided are based on the averages contained in Table 4.8-5 above, which are considered representative.
- 4.8.50 Three UCS tests were carried out in the mudstone in BH BB011 and recorded values from 10.1 – 39.3 MPa. The sample recording the lower value was taken from material described as fossiliferous carbonate mudstone whilst the two higher values of 38.8 and 39.3MPa were taken from material described as carbonate mudstone/ muddy limestone and are likely to be stronger than the more consistent mudstone encountered elsewhere on the scheme.
- 4.8.51 At depths shallower than approximately 8m bgl, the majority of the results returned an $I_{s(50)}$ of less than 1 these results generally correspond to a depth below top of rock of between 2m and 3.5m. Beneath this level there is a wide range of results up to 10.
- 4.8.52 Based on the following relationship, a typical UCS for the mudstone is considered to be 6MPa, based on a typical $I_{s(50)}$ of around 0.6. C is a constant relating to published or site-specific correlation, typically 7-10 for weaker rocks or wider used 23-24, as discussed in CIRIA Report 181 [44].

$$UCS = C \times I_{s(50)} = 10 \times 0.6 = 6 \text{ MPa}$$

- 4.8.53 Note that the strength value provided is indicative only and the strength of the mudstone recorded in logged descriptions varies widely from extremely weak to strong to very strong. Logged descriptions should be used to complement laboratory measurements to determine the likely strength of rock in any given area of the site.

Limestone

- 4.8.54 A summary of laboratory and in-situ data available for limestone is presented in Table 4.8-6. Ground parameters are discussed below. It should be noted that the results have not been split between the Great Limestone Formation present at the west of the scheme and the Alston Formation present to the east.

Table 4.8-6: Scheme 7 – In-situ and Laboratory Test Results for Limestone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	8	24.27-26.48	25.83	26.14
Natural Moisture Content (%)	1	7.1	7.1	7.1
PSD	1	N/A	N/A	N/A
Strength				
SPT N and N_{60} value ¹	2	>100	-	-
Rock water content (%)	4	0.2-1.3	0.55	0.35
UCS (MPa)	7	20.1-142	74.7	89.5
Point Load Index	64	1.6-8.2	4.82	4.95
¹ For SPT N_{60} /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 7-6 for full extrapolated values.				

Classification

4.8.55 There is very limited information available for this material. A bulk unit weight of 26kN/m³ is considered representative.

Rock Testing

4.8.56 Values of rock moisture content are provided based on the averages contained in Table 4.8-6 above, which are considered representative.

4.8.57 Seven UCS tests were carried out in the limestone with average values in the range of approximately 75 – 90MPa. This is fairly consistent with the results of point load testing which recorded a median $I_{s(50)}$ of approximately 5, which corresponds to a UCS of approximately 100MPa using a 'C' value of 20, appropriate for stronger rocks. A value of 75MPa is suggested which is the lower of the averages from UCS testing and value derived from point load testing.

4.8.58 Note that the strength value provided is indicative only and the strength of the limestone recorded in logged descriptions varies widely from medium strong to very strong. Logged descriptions should be used to complement laboratory measurements to determine the likely strength of rock in any given area of the site.

Sandstone

4.8.59 A summary of laboratory and in-situ data available for sandstone is presented in Table 4.8-7. Ground parameters are discussed below.

Table 4.8-7: Scheme 7 – In-situ and Laboratory Test Results for Sandstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Point Load Index	10	2.3-3.7	2.85	2.75

Rock Testing

4.8.60 Ten individual point load tests were carried out at approximately 20m bgl in BH BB024. The results were relatively consistent and recorded an average $I_{s(50)}$ of approximately 2.8.

4.8.61 Based on the following relationship, a typical UCS for the sandstone is considered to be approximately 56MPa, based on a typical $I_{s(50)}$ of around 2.8. This corresponds with the logged descriptions of moderately weak to medium strong (BH BB018) and medium strong (BH BB024).

$$UCS = C \times I_{s(50)} = 20 \times 2.8 = 56 \text{ MPa}$$

Groundwater

4.8.62 Site-wide groundwater conditions have been discussed for each of the sections. For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level with the exception of the area along the A67, where groundwater levels should be assumed to be at rockhead level.

Summary of Ground Parameters for Scheme 7

4.8.63 Table 4.8-8 presents a summary of ground parameters proposed to inform the preliminary design along scheme 7.

Table 4.8-8: Scheme 7 – Summary of ground parameters

Stratum	Unit Weight	NMC	PI	c'	ϕ'_{pk}	Cu	E'	UCS	mv
	kN/m ³	%	%	kPa	°	kPa	MPa	MPa	m ² /MN
Glacial - Cohesive	21	18	19	0	27	40 (0-3m bgl) 100 at 3m bgl increasing to 225 at 16m bgl)	5 (0-3m bgl increasing to 30 at 16m bgl)	-	0.16 to 0.03
Glacial - Granular	21	24	-	0	30 (0-5m bgl) 33 (>5m bgl)	-	10 (0-5m bgl) 20 (>5m bgl)	-	-
Mudstone	25*	16	17	-	-	-	-	6	-
Limestone	26*	-	-	-	-	-	-	75	-
Sandstone	26*	-	-	-	-	-	-	56	-

(*) in the absence of sufficient test data, values have been used for similar rock types.

4.9 Scheme 7 Attenuation Ponds

- 4.9.1 Attenuation ponds are proposed as a means of attenuation and treatment of highways drainage only. The ponds will have a permanent water depth of 0.5m and a stored water volume on top. Infiltration testing was undertaken at or close to a number of proposed attenuation ponds at the recommendation of the karst desk study [17]. During design development after the ground investigation, it was subsequently decided all ponds will be lined by clay or by synthetic liner to limit infiltration.
- 4.9.2 Ponds are predominantly, while not exclusively, in cut. Overland flow is unattenuated and drained via cut off ditches and filter drains.
- 4.9.3 The results of variable head permeability tests and soakaway tests are contained in Table 4.9-1 and Table 4.9-2 below.

Table 4.9-1: Scheme 7 - Variable Head Permeability Test Results

Hole ID (Section)	Type of Well	Depth Range (m bgl)	Response Zone Geology	Reported Permeability (m/s)
BH BB002 (7.1)	19mm SPIE	3.5-4.5	Glacial Deposits - Cohesive	2.39E-04
BH BB004 (7.1)	19mm SPIE	1-5	Glacial Deposits - Cohesive	1.43E-05
BH BB005 (7.1)	19mm SPIE	4.5-5.5	Glacial Deposits - Granular	4.66E-05
BH BB011 (7.2)	19mm SPIE	3.5-4.5	Mudstone	1.43E-04
BH BB012	19mm SPIE	7-9	Limestone	1.13E-05

Hole ID (Section)	Type of Well	Depth Range (m bgl)	Response Zone Geology	Reported Permeability (m/s)
(7.2)				
BH BB013 (7.2)	50mm SP	1.5-4	Glacial Deposits - Cohesive	9.18E-05
BH BB018 (7.3 & 7.4)	19mm SPIE	3.5-5	Limestone	1.69E-04
BH BB022 (7.3 & 7.4)	19mm SPIE	1.5-3	Glacial Deposits - Cohesive	2.09E-07
BH BB024 (7.3 & 7.4)	19mm SPIE	1-3	Glacial Deposits - Cohesive	3.83E-06

Table 4.9-2: Scheme 7 - Soakaway Test Results

Hole ID (Section)	Test Zone Depth (m bgl)	Test Zone Geology	Soil Infiltration Rate (m/s)
TP BB005 (7.1)	1.15-2	Firm to stiff brown and grey sandy slightly gravelly clay with medium cobble content	N/A
TP BB011 (7.2)	1.26-2	Soft light brown sandy gravelly clay with low cobble content	4.24 x10 ⁻⁵
	1.31-2		7.06 x10 ⁻⁵
	1.31-2		3.32x10 ⁻⁵
TP BB014 (7.2)	1.35-2	Firm slightly sandy gravelly clay with medium cobble content Clayey sandy gravel with medium cobble content Firm to stiff slightly sandy gravelly clay	N/A

4.9.4 Due to changes in scheme design the permeability test positions no longer correspond to pond locations. The soakaway test undertaken within TP BB011 is the closest, and it is located within 25m of a proposed pond.

4.9.5 Further targeted ground investigation will be required to assess ground conditions and soil permeability at each pond location.

4.10 Scheme 7 Aggressive Ground Conditions

4.10.1 In order to assess how potentially aggressive the ground may be to buried concrete the results of the relevant testing have been assessed in line with the requirements of BRE Special Digest 1 [45].

4.10.2 The Design Sulphate Class and associated ACEC class have been derived on a scheme wide basis for the following strata:

- Glacial Deposits – cohesive
- Glacial Deposits - granular
- Mudstone
- Limestone

- 4.10.3 Only one result was available for Made Ground and no results were available for sandstone. Consequently there is insufficient data to provide an assessment for these strata.
- 4.10.4 The results of the assessment are summarised in Table 4.10-1 below. For Cohesive Glacial Deposits and mudstone, where the oxidisable sulfides calculation indicates that pyrite is probably present (OS >0.3% in a significant number of samples), the Design Sulphate Class and ACEC class have been provided for both undisturbed and disturbed material (excluding and including respectively the total potential sulphate that may result from oxidation following ground disturbance).

Table 4.10-1: Scheme 7 - Aggressive Ground Test Results

Stratum	Characteristic Value					Design Sulphate Class	ACEC Class
	SO4 2:1 water/soil extract (mg/l) Characteristic value [No. of tests]	SO4 groundwater (mg/l) Characteristic value [No. of tests]	OS (%) Characteristic value [No. of tests]	TPS (%) Characteristic value [No. of tests]	pH Characteristic value [No. of tests]		
Glacial Deposit-Cohesive (disturbed)	300 [28]	100 [1]	1.4 [28]	1.5 [28]	6.4 [28]	DS-4	AC-4
Glacial Deposit-Cohesive (undisturbed)	300 [28]	100 [1]	-	-	-	DS-1	AC-1
Glacial Deposit-Granular	0 [5]	-	0.1 [5]	-	-	DS-1	AC-1
Mudstone (disturbed)	100 [6]	0 [1]*	2.0 [6]	2.1 [6]	7.7 [6]	DS-4	AC-4
Mudstone (undisturbed)	100 [6]	0 [1]*	-	-	-	DS-1	AC-1
Limestone	0 [2]	0 [1]*	0.1 [2]	-	-	DS-1	AC-1

* One water sample taken from an installation where the response zone crossed the strata boundary between mudstone and limestone was used in the assessment for both strata.

- 4.10.5 Two groundwater samples were taken, one from each of the installations in BH BB007 and BH BB013. The response zone in BH BB007 is located across the boundary between the mudstone and limestone and was used to inform the assessment of potential aggressive ground for both rock types. The response zone in BH BB013 is located in Cohesive Glacial Deposits.

4.11 Geotechnical Category of Scheme 7

- 4.11.1 With reference to CD622 [1] the scheme has been assessed as Geotechnical Category 2 as it “includes conventional types of geotechnical structures, earthworks and geotechnical activities, with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions”. No new information has come to light following the recent ground investigation that would change this classification.

5 Scheme 7: Bowes Bypass - Geo-environmental Model

5.1 Introductory Information

- 5.1.1 This section summarises the geo-environmental testing of soils encountered along the scheme as well as testing of groundwater and surface water samples. The analysis of this data has enabled a preliminary assessment of the risks posed to human health and controlled waters by comparing the test results against screening values to provide an indication of relative levels of contamination present along the scheme. This approach is consistent with Stage 1 of the Environment Agency's Land Contamination Risk Management (LCRM) [46]. This review also includes waste hazard classification of the samples analysed, and a discussion on potential waste disposal routes.
- 5.1.2 An assessment of the potential contamination sources on site was carried out within the PSSR [6]. This study was augmented by a review of the site history within the chapter 9 (Geology and Soils) of the PEIR [20].

5.2 Visual and Olfactory Evidence of Contamination

- 5.2.1 Visual and olfactory evidence of contamination during the ground investigation predominantly comprised varying amounts of coal and ash locally within Made Ground. The observations are summarised in Table 5.2-1.

Table 5.2-1: Scheme 7- Visual and Olfactory Evidence of Contamination

Exploratory hole no.	Observation	Depth (m bgl)	Description
WS BB002	Visual Observation	0.20-1.20	Coal present
TP BB005	Visual Observation	0-0.20	Coal present
	Visual Observation	0.20-1.00	Coal and clinker present
TP BB006	Visual Observation	0.35-1.80	Ash present

5.3 Chemical Testing Overview

- 5.3.1 The strategy for chemical testing was developed based upon consideration of the preliminary conceptual site model presented in the Technical Appraisal Report (TAR) [47], PSSR [6], PEIR [20] and the materials encountered during the ground investigation.
- 5.3.2 Soil and water samples selected by the A66 NTP Integrated Project Team were sent to Derwentside Environmental Testing Services (DETS) under a subcontract arrangement with the contractor AEG Ltd. for selected chemical analysis. The testing carried out on soil and water samples are summarised in sub-heading 5.4 to 5.7 below.
- 5.3.3 A full description of analytical suites and limits of detection is presented in Appendix E.

5.4 Chemical Testing – Soils

- 5.4.1 A total of 56 soil samples from exploratory hole locations relevant to scheme 7 were tested for a range of chemical determinands likely to be encountered on the site as a result of its current and historical land use and geological setting. A summary of soil chemical testing undertaken is presented in Table 5.4-1.
- 5.4.2 The samples tested were taken from depths ranging from 0.10m bgl to 5.10m bgl and from the range of soil types encountered in the exploratory locations. A catalogue of soil samples subjected to chemical testing is contained in Appendix E.
- 5.4.3 Soil chemical analysis results are presented in Appendix E (Geoenvironmental Testing) of AEG's Factual Report [37] included in Appendix J.

Table 5.4-1: Scheme 7- Summary of Chemical Testing in Soil Samples

No of Samples	Description	Notes
56	Suite E1a – Primary metals and metalloids	Comprises Arsenic, Boron (Water soluble), Cadmium, Chromium (total), Chromium (trivalent), Chromium (hexavalent), Copper, Lead, Mercury, Nickel, Selenium and Zinc.
54	Suite E2 – Inorganics	Comprises pH, Soil Organic Matter, Total Organic Carbon, Sulphate, Sulphide, and loss on ignition.
54	Suite E3 – CN/Phenol	Comprises Cyanide (free) and Phenols (total).
34	Suite E4a – Asbestos	Asbestos Presence and ID
52	Suite E6a – TPH CWG	Total Petroleum Hydrocarbons Criteria Working Group
52	Suite E7a – Speciated PAHs	USEPA 16 Poly Aromatic Hydrocarbons
21	Suite H - WAC	Inert Waste Landfill Schedule

5.5 Chemical Testing – Leachate

- 5.5.1 The Environment Agency Remedial Targets Methodology [48] states that pore water concentrations determined for samples with a 2:1 liquid/solid ratio are preferable for risk assessment purposes with the 10:1 liquid/solid ratio leachate preferred for waste characterisation.
- 5.5.2 Samples selected to undergo Waste Acceptance Criteria (WAC) analysis were subject to leachate preparation using method BS EN 12457-3 [49] which involves a 2 stage leaching process (a moisture corrected 2:1 liquid to solid ratio leaching step for 6 hours followed by a moisture corrected 8:1 liquid to solid ratio leaching step on the remaining material for 18 hours). The combined results from which are calculated to provide analytical data reported as mg/kg dry weight at 10:1.
- 5.5.3 A total of 21 soil samples from exploratory hole locations were also subjected to leachate preparation and analysis to ascertain the mobility of substances in the soil. A summary of leachate analysis undertaken is presented in Table 5.5-1.
- 5.5.4 The samples tested were taken from depths ranging from 0.20 m bgl to 3.50 m bgl and from the range of soil types encountered in the exploratory locations. A list of leachate samples scheduled for analysis is contained in Appendix E.
- 5.5.5 Leachate chemical analysis results are found in Appendix E (Geoenvironmental Testing) of AEG's Factual Report [37] included in Appendix J.

Table 5.5-1: Scheme 7– Summary of Chemical Testing in Leachate Samples

No of Samples	Description	Notes
21	Electrical Conductivity / Total Dissolved Solids / Chloride / Fluoride / Sulphate / DOC	2:1 & 8:1 Leachable
21	Metals (Antimony, Arsenic, Barium, Cadmium, Copper, Chromium, lead, Mercury, Molybdenum, Nickel, Selenium, Zinc)	2:1 & 8:1 Leachable
21	Phenols	2:1 & 8:1 Leachable

5.6 Chemical Testing – Groundwater and Surface Water

- 5.6.1 A total of two groundwater samples were recovered from monitoring wells installed during the scheme 7 ground investigation. The locations of the monitoring wells are presented within drawings HE565627-AMY-HGT-S07-DR-CE-100001-5 in Appendix A and a summary of the groundwater sampling locations are presented in Table 5.6-1.
- 5.6.2 Groundwater monitoring wells were purged of three well volumes of groundwater (unless indicated otherwise on the monitoring results) on the first of six groundwater monitoring rounds undertaken between 30 March 2021 and 27 August 2021.

Table 5.6-1: Scheme 7- Summary of Groundwater Samples

Expl. Hole	Response Zone Depth (m bgl)	Screened Horizon
BH BB007	10.00-12.00	Glacial
BH BB013	1.50-4.00	Glacial

- 5.6.3 All groundwater and surface water samples were subjected to a full suite of chemical analysis as presented in Table 5.6-3.
- 5.6.4 Two surface water samples were recovered from key sampling points on surface waters located within scheme 7 on the 30 March 2021. The locations of the surface water sampling points are presented within drawings HE565627-AMY-HGT-S07-DR-CE-100001-5 in Appendix A and a summary of the surface water sampling locations are presented in Table 5.6-2.

Table 5.6-2: Scheme 7- Surface Water Sampling Locations

Surface Water Sampling point	Sample point Co-ordinates (NGR)	Watercourse
SW BB001	398441E, 513060N	Unnamed Tributary of River Greta
SW BB002	400897E,513018N	Unnamed Tributary of River Greta

- 5.6.5 Groundwater chemical analysis results are found in Appendix E (Geoenvironmental Testing) of AEG's Factual Report [37] included in Appendix J.

Table 5.6-3: Scheme 7– Summary of Chemical Testing of Groundwater and Surface Water Samples

Test Suite	Groundwater Sample	Surface Water Sample
Metals and Metalloids (F1a)	2	2
Major Ions (F2)	2	2
Ammoniacal Nitrogen (F3)	2	2
Total Suspended Solids (F5)	2	2
Oxygen Demand (F6)	2	2
TPHCWG (F7a)	2	2
BTEX (F7b)	2	2
Speciated PAHs (F8)	2	2
Phenols and Cyanides (F10)	2	2

5.7 Groundwater Level and Ground Gas Monitoring

- 5.7.1 No potentially significant sources of ground gas were identified within the PSSR [6].
- 5.7.2 Made Ground can potentially be a source of ground gas if it contains significant organic material and is encountered in significant thicknesses. Made Ground was sporadically encountered across the route at 16 exploratory locations and typically ranged between 0.15m and 1.4m in thickness, with one borehole (BB BH002) recording up to 2.9m in thickness.
- 5.7.3 A combination of the following conditions would be required to consider Made Ground a viable source of ground gas and to undertake gas monitoring in accordance with best practice guidance (CL:AIRE (2012)) [50]:
- A combination of a maximum thickness of 5m and an average thickness less than 3m,
 - Degradable content observed during the site investigation, and;
 - Total organic carbon (TOC) of approximately 4%
- 5.7.4 No degradable content was observed during the investigation and the average total organic carbon (TOC) for Made Ground is 1.9%.
- 5.7.5 Based on the findings of the investigation the Made Ground at the site is considered to have limited gassing potential and there is negligible risk from ground gas. Therefore no ground gas monitoring was undertaken for this scheme.
- 5.7.6 Groundwater levels were recorded on six occasions, undertaken between 31 March 2021 and 27 August 2021.
- 5.7.7 The Monitoring and Post Fieldwork Environmental Sampling Methodology is set out in section 3.5 of AEG's Factual Report [37] included in Appendix J.
- 5.7.8 The results of the groundwater level monitoring, together with the temporal (weather) conditions are tabulated in AEG's Factual Report [37] included in Appendix J.
- 5.7.9 The groundwater level monitoring results are summarised in Table 5.7-1.

Table 5.7-1: Scheme 7– Groundwater Monitoring Results

Expl. Hole	Response Zone Depth (m bgl)	Screened Horizon	Water Level Range (m bgl)	Water Level Range (mOD)
BH BB002	3.50-4.50	Glacial (Gravels)	2.16 – 2.26	293.95 – 294.05
BH BB003	10.00-12.00	Glacial (Clays) / Mudstone	7.50 – 7.61	279.95 – 280.04
BH BB004	1.00-5.00	Glacial (Clays)	1.38 – 1.48	287.28 – 287.35
BH BB005	4.50-5.50	Glacial (Gravels)	3.88 – 4.00	288.73 – 288.85
BH BB006	4.50-5.50	Glacial (Gravels)	4.06 – 4.43	287.46 – 287.83
BHBB007	10.00-12.00	Mudstone	4.33 – 4.50	287.17 – 287.34
BH BB008	2.00-3.00	Glacial (Clays)	0.69 – 1.32	289.97 – 290.50
BH BB009	6.00-7.00	Mudstone	3.58 – 3.96	285.97 - 286.35
BH BB010	1.00-3.00	Mudstone	Dry	--
BH BB011	3.50-4.50	Mudstone	1.32 -1.35	282.07 – 282.20
BH BB012	7.00-9.00	Limestone	2.06 - 2.12	280.41 – 280.47
BH BB013	1.50-4.00	Glacial (Clays)	2.34 – 2.85	287.94 – 288.45
BH BB014	1.50-3.50	Glacial (Clays)	1.34 – 2.01	282.55 – 282.22

Expl. Hole	Response Zone Depth (m bgl)	Screened Horizon	Water Level Range (m bgl)	Water Level Range (mOD)
BH BB015	1.00-3.00	Glacial (Clays/Gravels)	1.47 - 1.51	285.69 – 2.85.73
BH BB016	1.50-2.40	Glacial (Clays)	Dry	--
BH BB018	3.50-5.00	Limestone	3.86 - 4.09	267.32 – 267.55
BH BB022	1.50-3.00	Glacial (Clays)	0.36 – 0.78	261.57 – 261.99
BH BB023	5.00-7.00	Limestone	0.98 – 1.52	263.94 – 264.48
BH BB024	1.00-3.00	Glacial (Clays)	1.26 – 1.50	262.61 – 262.85
BH BB025	1.30-2.50	Glacial (Clays)	0.20 – 0.30	262.64 – 262.74

5.8 Human Health Assessment – Site End Users

- 5.8.1 Key potential sources of contamination have been identified and discussed in the PSSR [6] and PEIR [20]. To enable a preliminary human health risk assessment, suitable Generic Assessment Criteria (GAC) have been selected for comparison with the chemical test results obtained from soil samples.
- 5.8.2 The Human Health Risk Assessment (HHRA) risk assessment methodology is outlined in Appendix F.
- 5.8.3 Soil Samples have been screened against GACs selected from the following strict hierarchy:
- Category 4 Screening Levels (C4SLs) as coordinated by CL:AIRE on behalf of the Department for Environment, Food and Rural Affairs [51];
 - LQM/CIEH Suitable 4 Use Levels (S4UL) [52], where published C4SLs are not available; or
 - Atkins ATRISKsoil Soil Screening Values (SSVs) [53].
- 5.8.4 Following a review of default land use scenarios underpinning these models, the “Public Open Space – Park” (POSPark) land use, utilising 1% Soil Organic Matter (SOM) has been selected for use on this project. It is considered to be suitably precautionary for the proposed land use under consideration (i.e. major highway scheme with associated earthworks, structures road verge landscaping and ancillary features such as attenuation ponds etc) with regards to selection of critical receptor and behavioural exposure parameters.
- 5.8.5 The full analytical results addressed in this report are presented in Appendix E (Geoenvironmental Testing) of AEG’s Factual Report [37] included in Appendix J.
- 5.8.6 The screening of results are presented in Appendix H, with exceedances of the POSPark assessment criteria summarised in Table 5.8-1.

Table 5.8-1: Scheme 7– Human Health Exceedances in Soil

Contaminant of Concern	GAC (mg/kg)	Location of Exceedance	Sample depth (m bgl)	Recorded Concentration (mg/kg)	Strata	Comment
Arsenic	170	TP BB004	0.3	240	Glacial Deposits	Historical presence of old railway
		TP BB010	1.0	260	Glacial Deposits	Historical presence of old railway

5.9 Asbestos Assessment

- 5.9.1 44 soil samples were screened for asbestos containing materials (presence and identification and quantification) as part of the laboratory assessment. Visual observations on site were also considered.
- 5.9.2 No asbestos was detected within any samples examined in the laboratory. No asbestos containing materials were observed during ground investigation.

5.10 Human Health Assessment – Construction and Maintenance Workers

- 5.10.1 The study area comprises a major highway scheme with associated earthworks, structures road verge landscaping and ancillary features such as attenuation ponds etc, and it is unlikely the public will access the land along the scheme on a routine basis post development.
- 5.10.2 Therefore, the preliminary human health assessment is primarily aimed at identifying significant contamination issues that may impact the scheme design or affect project personnel who will perform the infrastructure upgrade works and subsequent maintenance.
- 5.10.3 Construction and maintenance workers are more likely to be at risk from acute (short term, high dose) exposure to contaminants within the soils during periods of episodic occupational exposure.
- 5.10.4 GACs are for the most part (with the exception of cyanide) protective of chronic (i.e., long term, low dose) exposure rather than the effects of acute exposure. In general, GACs which are protective of chronic exposure are orders of magnitude lower than those which are protective of acute exposure.
- 5.10.5 The results of the chronic exposure assessment undertaken within sub-heading 5.8 above are considered to be conservative when assessing risks posed to construction and maintenance workers on a site in an occupational exposure setting.
- 5.10.6 Exceedances of GACs identified within Table 5.8-1 are considered to be a precautionary when assessing the risks posed to construction and maintenance workers in an occupational exposure setting, and any GAC exceedances should be reviewed with a view to putting in place mitigation measures such as the implementation of Safe Systems of Work (SSoW), use of appropriate personal protective equipment (PPE) (e.g. gloves / overalls etc) and /or use of respiratory protective equipment (RPE) as necessary.

5.11 Controlled Waters Risk Assessment – Tier 1 Assessment

- 5.11.1 Leachate, groundwater, and surface water samples recovered and analysed in the course of the ground investigation have been assessed to identify potential risks to groundwater resources underlying the study area and to surface waters in the vicinity of the site.
- 5.11.2 The Controlled Waters Risk Assessment (CWRA) has been undertaken with an initial precautionary “Tier 1” assessment, followed by a more specific “Tier 2” assessment of any Tier 1 exceedances. The “Controlled Waters Risk Assessment Methodology” is set out in Appendix F.
- 5.11.3 The “Tier 1” Controlled Waters Risk Assessment has been undertaken using the lowest of available relevant Water Quality Standards (WQS) (i.e., Drinking Water Standards (DWS) or Environmental Quality Standards (EQS).
- 5.11.4 The results of the Tier 1 Controlled Waters Risk Assessment screen are presented in Appendix H.
- 5.11.5 Where exceedances of “Tier 1” water quality standards are identified, a review can be undertaken to establish whether the sample can be advanced to a more detailed “Tier 2” review and assessment in accordance with the “Controlled Waters Risk Assessment Methodology” set out in Appendix H.

- 5.11.6 The samples which have failed “Tier 1” water quality standards are summarised in Table 5.11-1. Those samples which have failed Tier 1 have been progressed to “Tier 2” and are presented in Table 5.12-1.
- 5.11.7 No surface water samples were recorded as exceeding Tier 1 criteria.
- 5.11.8 Marginal exceedances of the groundwater criteria were identified in BH BB007 for zinc and ammoniacal nitrogen. Pyrene marginally exceeded the groundwater criteria in BH BB013. Therefore, these have been progressed to Tier 2 assessment.
- 5.11.9 Soil leachate tests identified exceedances of molybdenum in ten samples and zinc in two samples. Soil leachate tests do not simulate in-situ conditions and concentrations from soil leachate tests are considered conservative as they do not take account of variation in solubility, dilution and attenuation which may reduce the contaminant concentration along the flow path. Therefore, soil leachate concentrations often exceed water quality criteria. Due to this, the exceedances have not been progressed to a Tier 2 assessment but are qualitatively assessed under sub-heading 5.15.

Table 5.11-1: Scheme 7– Summary of Tier 1 WQS Failures.

Sample Location	Sample Type	Depth	Contaminant of Concern	Tier 1 WQS (1mg/l / 2µg/l)	WQS	Tier 2 Assessment
BH BB007	Groundwater	4.45	Copper	0.001 ¹	EQS	Yes
BH BB013	Groundwater	2.85	Copper	0.001 ¹	EQS	Yes
BH BB007	Groundwater	4.45	Zinc	0.0109 ¹	EQS	Yes
BH BB007	Groundwater	4.45	Ammoniacal Nitrogen as N	0.04 ¹	EQS	Yes
BH BB013	Groundwater	2.85	Pyrene	0.01 ²	LOD	Yes
BH BB003	Leachate	0.80	Copper	1 ²	EQS	No
BH BB005	Leachate	3.50	Molybdenum	0.5 ²	LOD	No
BH BB007	Leachate	0.20	Molybdenum	0.5 ²	LOD	No
BH BB007	Leachate	1.20	Zinc	10.9 ²	EQS	No
BH BB007	Leachate	1.20	Copper	1 ²	EQS	No
BH BB008	Leachate	0.20	Molybdenum	0.5 ²	LOD	No
BH BB008	Leachate	0.20	Copper	1 ²	EQS	No
BH BB009	Leachate	1.00	Molybdenum	0.5 ²	LOD	No
BH BB011	Leachate	0.30	Molybdenum	0.5 ²	LOD	No
BH BB013	Leachate	1.00	Molybdenum	0.5 ²	LOD	No
BH BB015	Leachate	0.20	Molybdenum	0.5 ²	LOD	No
BH BB015	Leachate	0.20	Copper	1 ²	EQS	No
BH BB016	Leachate	1.00	Zinc	10.9 ²	EQS	No
TP BB001	Leachate	0.20	Copper	1 ²	EQS	No
TP BB004	Leachate	0.30	Molybdenum	0.5 ²	LOD	No
TP BB004	Leachate	2.40	Molybdenum	0.5 ²	LOD	No

Sample Location	Sample Type	Depth	Contaminant of Concern	Tier 1 WQS (1mg/l / 2µg/l)	WQS	Tier 2 Assessment
TP BB005	Leachate	0.30	Molybdenum	0.5 ²	LOD	No
TP BB008	Leachate	0.30	Copper	1 ²	EQS	No
TP BB011	Leachate	0.30	Copper	1 ²	EQS	No
TDP BB001	Leachate	0.20	Copper	1 ²	EQS	No

Notes: Leachate results are provided in µg/l.

5.12 Controlled Waters Risk Assessment – Tier 2 (Groundwater)

- 5.12.1 The results of the Tier 2 Controlled Waters Risk Assessment screen are presented in Appendix H.
- 5.12.2 The preliminary CSM identified the following controlled water receptors within 500m of the scheme:
- Two unnamed tributaries of the River Greta within the site boundary.
 - Both the underlying bedrock and superficial deposits are designated as Secondary A aquifers; and
 - Groundwater abstraction utilised for small private domestic and agricultural supply between 80 to 120m off alignment.
- 5.12.3 Samples which exceeded the Tier 1 screen have been identified in Table 5.11-1. These samples were then assessed based on more targeted criteria taken from the CSM.
- 5.12.4 Tier 2 assessment comprises a comparison against drinking water standards (where available) due to the identified private groundwater abstraction utilised for private and domestic use. Where DWS are not available EQS from Tier 1 have remained as the assessment criteria.
- 5.12.5 There are three exceedances (Zinc, Ammoniacal Nitrogen and Pyrene) of the relevant standards in the groundwater samples taken from the boreholes as presented in Table 5.12-1.

Table 5.12-1: Scheme 7– Summary of Tier 2 Chemical Testing in Groundwater Samples

Expl. Hole	Contaminant of Concern	Tier 2 WQS (1mg/l / 2µg/l)	Screening Criteria Source	Result (1mg/l / 2µg/l)
BH BB007	Copper	2 ¹	DWS	0.0024 ¹
BH BB013	Copper	2 ¹	DWS	0.0022 ¹
BH BB007	Zinc	0.0109 ¹	EQS*	0.012 ¹
BH BB007	Ammoniacal Nitrogen as N	0.5 ¹	DWS	0.069 ¹
BH BB013	Pyrene	0.01 ²	LOD ¹	0.02 ²

Notes: * No DWS available.

5.13 Re-use of Soils

- 5.13.1 Introducing a soil material re-use strategy will be consistent with National Highways' commitment to incorporate sustainable methods into the design of projects as outlined in GG103 [54]. The re-use of soil materials within the scheme will reduce quantities of material destined for landfill, waste generation, unnecessary costs, and unnecessary journeys.

- 5.13.2 In addition, the requirement to import fill materials (and associated costs) may also be reduced. This will assist with meeting National Highways' environmental sustainability goals, including minimising greenhouse gas emissions, reducing waste generation, using sustainably sourced materials, and being resource efficient and reflecting a circular approach to the use of materials.
- 5.13.3 Prior to excavations and re-use of the material, an appropriate re-use methodology and Materials Management Plan, and associated Verification Plan document, should be completed to enable the re-use of the material. The Verification Plan should identify how the placement of materials is to be recorded and the quantity of materials to be used, including a statement on how the use of the materials relates to the highway design. Verification testing results should be compared to re-usability criteria from a corresponding Series 600 Earthworks Specification and Verification Plan.

5.14 Indicative Waste Classification

- 5.14.1 If possible, it is preferable the scheme is designed to minimise volume of surplus soil materials which arise, or material can be re-used in preference to landfill disposal. However, it is recognised the project may not be able to re-use or retain all surplus materials on-site (due to programme, storage space or geotechnical requirements) and off-site disposal of a quantity of surplus soils may be unavoidable.
- 5.14.2 Waste classification is a two-stage process, with the first step comprising a hazard assessment of the soil quality data in line with the guidance set out in the Environment Agency: Guidance on the Classification and Assessment of Waste Technical Guidance WM3 document, to provide the likely LoW code. The second step comprises targeted testing of Waste Acceptance Criteria (WAC) to confirm the most appropriate landfill waste stream.
- 5.14.3 The Hazard and Waste Acceptance assessment methodology is outlined in Appendix G and The full HazWasteOnline™ [55] reports are presented in Appendix I.

Hazard Assessment

- 5.14.4 The HazWasteOnline [55] tool has been used to assess 15 Made Ground, 7 Topsoil, 42 Glacial and 1 Mudstone samples.
- 5.14.5 All samples were classified as "17 05 04 (soil and stones other than those mentioned in 17 05 03) Non-Hazardous Waste".

Waste Acceptance Criteria for Disposal

- 5.14.6 WAC testing identified that the majority of material may be suitable for inert landfill, however, five samples were unsuitable due to exceedances of Inert criteria. A summary of WAC tests and waste classification is provided in Table 5.14-1.

Table 5.14-1: Scheme 7 –Waste Assessment

Sample ID	Depth (m bgl)	Stratum	Waste Classification	Landfill Stream
TP BB001	0.20	Topsoil	17 05 04 Non Hazardous Waste	Suitable for Non Hazardous Landfill
BH BB017	0.20	Topsoil	17 05 04 Non Hazardous Waste	Suitable for Non Hazardous Landfill
BH BB002	1.00	Made Ground	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB001	0.20	Made Ground	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB005	0.30	Made Ground	17 05 04 Non Hazardous Waste	Suitable for Non Hazardous Landfill

Sample ID	Depth (m bgl)	Stratum	Waste Classification	Landfill Stream
TP BB009	0.30	Made Ground	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB011	0.30	Made Ground	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB003	0.80	Glacial	17 05 04 Non Hazardous Waste	Suitable for Non Hazardous Landfill
BH BB004	2.40	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB005	3.50	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB007	1.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB008	0.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB009	1.00	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB013	1.00	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB014	1.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB015	0.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
BH BB016	1.00	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB001	2.00	Glacial	17 05 04 Non Hazardous Waste	Suitable for Non Hazardous Landfill
TP BB004	0.30	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB006	1.00	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP BB008	0.30	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill

5.15 Conclusions and Recommendations

5.15.1 This section has provided a preliminary assessment of the potential land contamination conditions and risks to the proposed development. Overall, the assessment indicates there is low risk from land affected by contamination within scheme 7. A summary of the findings are presented below and recommendations for further work, where required.

Human Health

5.15.2 The preliminary human health risk assessment has identified two exceedances of arsenic in natural strata. The exceedances are located within an area known to have been formerly associated with a railway station and track.

- 5.15.3 Whilst these exceedances are shallow, the primary exposure pathway for arsenic is via direct contact and the proposed scheme will eliminate this exposure pathway for future road users due to the presence of hardstanding. Therefore, the primary receptors of concern are construction workers and maintenance workers. The risks to these receptors can be controlled through appropriate site management and Personal Protective Equipment (PPE), see below.
- 5.15.4 Whilst no other exceedances were observed, further unidentified contamination may be present. Site operatives, which are the main receptors during infrastructure upgrade works and subsequent maintenance works, should be advised that the site has potential to be contaminated. Suitable PPE should be worn to protect workers from site specific hazards as described under the CIRIA R132 Guidance [56]. The primary risk for exposure from contaminants is via direct contact during construction works at the site, and therefore operatives should adopt good hygiene procedures and wear hand protection (nitrile gloves), long overalls (covering arms), and eye protection where necessary, in addition to standard PPE. Should olfactory or visual evidence of gross contamination be encountered on site it should be considered contaminated, work should cease, and a geo-environmental Specialist be consulted.

Controlled Waters

- 5.15.5 Zinc was recorded above the assessment criteria in BH BB007. No Made Ground was encountered at this exploratory location and it is situated within an area with no historical contaminative land uses and the surrounding land is recorded as primarily used for agriculture. Whilst zinc was detected within the glacial deposits at this location, it is not recorded in significant concentrations and unlikely to be the source for the exceedance in groundwater. Therefore, there is no attributable source of contamination present in the soils impacting controlled waters within the area. It is possible that the exceedance is due to general diffuse pollution, attributed to the possible use of pesticides and/or herbicides on land adjacent to the proposed scheme.
- 5.15.6 BH BB013 recorded pyrene above the assessment criteria. This location is situated within an area historically associated with the former rail station. Whilst recorded as an exceedance, it should be noted that the adopted criteria for pyrene (limit of detection) is conservative. No other polycyclic aromatic hydrocarbons (PAHs) were recorded above the limit of detection within the same sample indicating that there is not a significant source of contamination impacting controlled waters within the area.
- 5.15.7 Overall, the risk of contaminants migrating in groundwater is limited by the nature of the geological strata present. Glacials are present across much of the scheme which largely comprise of sandy gravelly clays. Whilst the glacial has some permeability through limited gravel bands, the clays are characteristically low in permeability and will reduce any migration of potential contaminants in groundwater to offsite receptors, such as the small-scale abstraction wells within the area.
- 5.15.8 Leachate testing identified exceedances of copper, zinc, and molybdenum however, the proposed scheme will reduce the impact to controlled waters by incorporate positive drainage and hardstanding which will have a positive effect of reducing infiltration and leaching potential of soils.
- 5.15.9 The proposed earthworks vary across the scheme, however in some areas cuttings up to 7m may be required. The earthworks will likely remove areas of isolated made ground further reducing the potential for the scheme to impact controlled waters. Further sampling of groundwater is recommended to inform any dewatering of areas of cutting and to provide additional baseline monitoring for construction.

Material Re-use

- 5.15.10 The proposed scheme will generate quantities of material from excavated Made Ground and Glacial. Whilst this material has been assessed as suitable for disposal as Inert and Non Hazardous Waste, the scheme design and construction works should aim to minimise offsite disposal to landfill. The assessment indicates that the majority of material tested is likely to be chemically suitable for re-use. The re-use of material should be undertaken in accordance

with a Materials Management Plan (MMP) under CL:AIRE Definition of Waste Code of Practice (DoWCoP). The MMP should be developed by a competent person, agreed with the regulator and include the following:

- Appropriate soil reuse criteria which is both protective of human health and controlled waters;
- Plans identifying where materials are to be excavated, stockpiled and re-used;
- Cross referenced to and within the Earthworks Specification detailing geotechnical re-use parameters;
- A suitable sampling regime for stockpiled material to be re-used;
- Details of the landowner, designer, earthworks contractor and regulatory contacts;
- Planning permissions relating to the site and a design description of certainty of use;
- A strategy to identify and manage unidentified contamination;
- Estimated volume of excavated materials and materials to be re-used;
- Details for managing excess or out of specification materials; and
- Details of a material tracking system and copies of the tracking/control forms to be used.

5.15.11 Additionally, a Verification Report will be required to be submitted to CL:AIRE to verify that materials have been placed in a safe and suitable manner. It is recommended that a competent person is present during site works to monitor the movement and placement of materials as well as document the relevant criteria required for a Verification Report.

Waste Classification and Disposal

5.15.12 If material cannot be re-used, then it is preferable that soils are sent to a suitable soil recycling facility. If disposal to landfill is required, then the waste hazard classification suggests materials are likely to be non-hazardous. WAC testing indicated that most material would be suitable for disposal in an inert landfill.

5.15.13 Whilst limited amounts of Made Ground were encountered within the scheme, there is potential for additional pockets of Made Ground to be present in areas which have not been investigated. Further samples should be taken in accordance with BS10175 [57] where waste disposal is required to confidently classify the waste. Samples should be scheduled for chemical testing by a geo-environmental specialist and assessed following receipt of the results.

5.15.14 Relevant chemical test data along with material descriptions and LoW codes will need to be provided to the proposed landfill and confirmation sought as to the final classification and subsequent cost associated with disposal.

6 Scheme 8: Cross Lanes to Rokeby – Ground Summary

6.1 Scheme Description

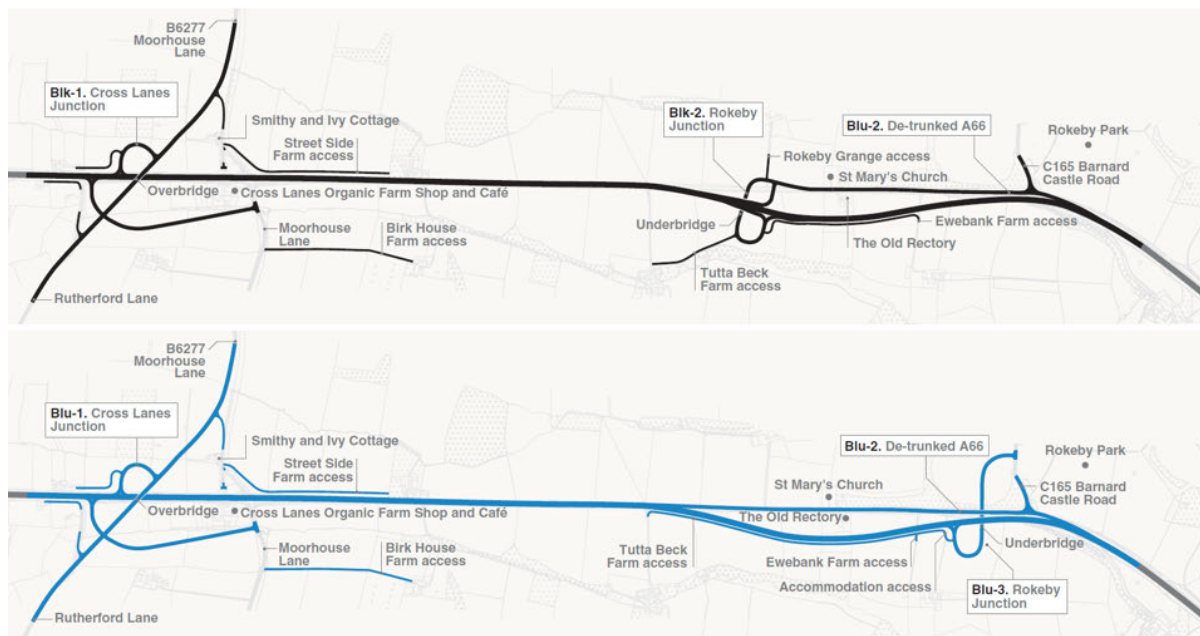


Figure 4: Black and Blue Options for Scheme 8 Route Alignment.

- 6.1.1 Scheme 8 covers between chainage Ch. 59+450m and Ch. 63+690m. Existing ground level at the start of the scheme is 228mOD and falls gradually to 138mOD at the end of the scheme.
- 6.1.2 Scheme 8 will mostly follow the existing A66 alignment. A link road will be constructed linking Rutherford Lane and the B6277 Moorhouse Lane with the existing junction at Cross Lanes upgraded to a compact grade separated junction where the new link road crosses over the A66. A new adjacent westbound carriageway will be constructed to the south between the B6277 junction at Cross Lanes and the existing Tutta Beck Cottage access and both carriageways will then be diverted to the south of The Old Rectory and St Mary's Church, re-joining the existing A66 at Rokeby. A new compact grade separated junction will be constructed to the west of The Old Rectory and St Mary's Church in an underpass to maintain the existing connectivity between the A66 and the local road known as Barnard Castle Road, which provides HGV access to Barnard Castle. The existing A66 will be de-trunked from the new junction to where it meets Barnard Castle Road. The eastbound merge from Barnard Castle Road onto the A66 will be maintained in its current location. This route is referred to as the black route. Refer to drawing HE565627-AMY-HGT-S08-DR-CE-100001-5 in Appendix A for scheme proposals (freeze E), with the positions of relevant exploratory holes.
- 6.1.3 A second option is also being considered, known as the blue route (see Figure 4), however this is currently not supported by the project team due to conflicts with national planning policy relating to its potential impact on the Registered Park and Garden, which it would bisect. The blue route will mostly follow the existing A66 alignment, replicating the alignment in the black route. As per the black route a link road will be constructed linking Rutherford Lane and the B6277 Moorhouse Lane with the existing junction at Cross Lanes upgraded to a compact grade separated junction where the new link road crosses over the A66. A new adjacent westbound carriageway will be constructed to the south between the B6277 junction at Cross Lanes and the existing Tutta Beck Cottage access and both carriageways will then be diverted to the south of The Old Rectory and St Mary's Church, re-joining the existing A66 at Rokeby.

Different to the black route a new junction will be constructed to the east of The Old Rectory and St Mary’s Church as an underpass beneath the Registered Park and Garden to maintain current connectivity between the A66 and Barnard Castle Road. The existing A66 will be de-trunked west of St Mary’s Church to the local road known as Barnard Castle Road. Refer to drawings HE565627-AMY-HGT-S08-DR-CE-100006-10 in Appendix A for scheme proposals with the positions of relevant exploratory holes.

6.1.4 For the purposes of design, scheme 8 is divided into three sections based on the proposed works under the scheme, see Table 6.1-1. The first segment extends from Ch. 59+450m to Ch. 60+300m incorporating the new link road Rutherford Lane/ B6277 Moorhouse Lane and the upgraded grade separated junction at Cross Lanes. The second segment extends from Ch. 60+300m to Ch. 62+000m incorporating the online widening of the existing alignment. The third segment extends from Ch. 62+000m to Ch. 63+690m incorporating the Rokeby underpass for both the black and blue routes.

6.1.5 The earthworks and structures proposed along scheme 8 are listed in Table 6.1-1.

Table 6.1-1: Scheme 8 - Structures and Earthworks

Section	Feature	Description	Chainage start (m)	Chainage end (m)
8.1	Start of Scheme and Cross Lanes Junction		59+450	60+300
	Earthwork 1 – Embankment/ at-grade	Widening of existing alignment. Embankment up to 2.5m for westbound A66. Eastbound A66 predominantly at grade.	59+450	60+300
	Earthwork 2 – Embankment, and at-grade	Embankments up to approximately 8.6m high associated with the Cross Lanes Junction overbridge and approach ramps. Link roads to Rutherford Lane, Moorhouse Lane and B6277 at-grade away from overbridge.	59+600	60+200
	New Culverts S08-C01, S08-C02, S08-C03, S08-C04, S08-C05, S08-C06	Six new 1.5m diameter culverts are proposed at the Cross Lanes Junction. S08-C01 – under local access road S08-C02 – under overbridge approach ramp S08-C03 – under local access road S08-C04 – under A66 access road S08-C05 – under existing A66 alignment S08-C06 – under overbridge approach ramp	59+960	60+100
	Structure 1 – New Cross Lanes Overbridge	New overbridge at Cross Lanes Junction.	59+930	59+930
8.2	Cross Lanes Junction to Rokeby Junction		60+300	62+000
	Earthwork 1 – Embankment	Widening of existing alignment between Cross Lanes Junction and Rokeby Junction and re-alignment in the east. Embankment of up to 3m for westbound A66. At grade/ nominal embankment up to 2m for eastbound A66.	60+300	62+000
	New Culvert S08-C07	Proposed 1.5m diameter culvert under existing A66 alignment.	60+780	60+780
8.3a	Rokeby Junction and end of Scheme (Black Option)		62+000	63+690
	Earthwork 1 – At-grade/ nominal	At grade and cutting up to 2.5m for westbound carriageway.	62+000	63+690

Section	Feature	Description	Chainage start (m)	Chainage end (m)
	cutting/ embankment	At grade and nominal embankment and cutting up to 2m for eastbound carriageway.		
	Earthwork 2 – Cutting, at-grade	Cuttings up to approximately 6m high associated with the Rokeby Junction underbridge. Some at-grade developments on access roads away from the overbridge.	62+070	62+230
	New Culverts S08-C08, S08-C09, S08-C010	Three new 1.5m diameter culverts are proposed at the Rokeby Junction. S08-C08 – under underbridge approach ramp S08-C09 – under proposed A66 alignment S08-C10 – under underbridge approach ramp	62+090	62+180
	Structure 1 – New Rokeby Junction Overbridge	New underbridge at Rokeby Junction	62+120	62+120
	New Culvert S08- C11	New 1.5m diameter culvert under proposed A66 alignment	62+540	62+540
	New Culvert S08- C12	New 1.5m diameter under proposed A66 alignment	62+900	62+900
	Culvert S08-C13 extension	Existing culvert to be extended	63+100	63+100
8.3b	Rokeby Junction and end of Scheme (Blue Option)		62+000	63+690
	Earthwork 1 – At- grade/ nominal cutting/ embankment	At grade and cutting up to 2.5m for westbound carriageway. At grade and nominal embankment and cutting up to 2m for eastbound carriageway.	62+000	63+690
	New Culvert S08- C08	New 1.5m diameter culvert under proposed A66 alignment	62+180	62+180
	New Culvert S08- C09	New 1.5m diameter culvert under proposed A66 alignment	62+550	62+550
	Earthwork 2 – Cutting, at-grade	Cuttings associated with the Rokeby Junction underbridge.	62+880	63+050
	New Culverts S08-C10, S08-C11, S08-C012	Three new 1.5m diameter culverts are proposed at the Rokeby Junction. S08-C10 – under proposed A66 alignment S08-C11 – under underbridge approach ramp S08-C12 – under underbridge approach ramp	62+880	63+050
	Structure 1 – New Rokeby Junction Underbridge	New underbridge at Rokeby Junction	63+050	63+050
	Culvert S08-C13 extension	Existing culvert to be extended	63+100	63+100

6.1.6 In addition to the structures and earthworks described above, a number of attenuation ponds will be constructed as part of the scheme, locations are provided in Table 6.1-2 below. The locations of the ponds will differ depending on the layout chosen.

Table 6.1-2: Scheme 8 - Attenuation Ponds

Section	Pond	Approximate chainage (m)
8.1	Pond 1 to the west of B6277	60+140
8.1	Pond 2 to the south of the A66, to the southwest of the junction between Moorhouse Lane and the proposed link road.	60+250
8.2	Pond 3 to the south of the A66	60+850
8.2	Pond 4 to the north of the A66	61+230
8.3a	Pond 5 to the south of the proposed A66 alignment (black option).	62+500
8.3a	Pond 6 to the south of the A66 (black option).	63+200
8.3b	Pond 5 to the south of the A66 (blue option).	62+500
8.3b	Pond 6 to the north west of the C165 Barnard Castle Road (blue option).	63+200
8.3b	Pond 7 to the south of the A66 (blue option).	63+200

6.1.7 The following reports contain further detail on each of the structures listed above:

- Scheme 8 Structures Options Report – Culverts [27][22]
- Scheme 8 Structures Options Report – Overbridges [28]

6.2 Scheme 8 Ground Conditions

6.2.1 The scheme wide ground conditions discussed here are based on data from the 2021 investigation supplemented by historical boreholes obtained from the BGS online dataviewer [13]. A summary of relevant sources of ground investigations is provided in Table 6.2-1. A full list is provided in Appendix C. Drawings HE565627-AMY-HGT-S08-DR-CE-200001-3 in Appendix A provide plan and longitudinal sections showing the proposed new alignment (black route) with the positions of relevant exploratory holes.

6.2.2 Proposals between Pounder Gill and Cross Lanes, Ch. 59+450m and Ch. 60+300m, were introduced after completion of the 2021 ground investigation and therefore only historical information is available along most of section 8.1.

6.2.3 Land access restrictions between Ch. 61+900m and Ch. 63+300m also resulted in limited information along these chainages.

Table 6.2-1: Scheme 8 - Quantities of Exploratory Holes

Ground Investigation	Number of locations
Historical ground investigations from BGS dataviewer	16
Allied Exploration Geotechnics, 2021	31

6.2.4 Exploratory holes in or close to the proposed scheme 8 works indicate the presence of the following geological strata.

- Topsoil
- Made ground – cohesive
- Glacial Deposits – cohesive
- Glacial Deposits – granular
- Mudstone
- Interlaminated Sandstone, Siltstone and Mudstone

6.2.5 Relevant exploratory hole locations and a more detailed description of the materials encountered in each section of this scheme are presented under sub-headings 6.3, 6.4 and 6.5 of this report. A summary of the materials encountered is presented in Table 6.2-2 below. Geotechnical laboratory and in-situ test results are presented within sub-heading 6.6.

Table 6.2-2: Scheme 8 – Summary of Materials Encountered

Strata	Scheme 8		
	8.1	8.2	8.3
Topsoil	✓	✓	✓
Made ground – cohesive and granular	✓	✓	-
Glacial Deposits – cohesive	✓	✓	✓
Glacial Deposits – granular	-	✓	✓
Bedrock	✓	✓	-

- 6.2.6 Ground conditions within scheme 8 generally comprise a sequence of thin Topsoil, overlying predominantly Cohesive Glacial Deposits and bedrock at depth.
- 6.2.7 Surface materials generally comprised a thin layer of Topsoil approximately 0.3m thick described as brown very clayey slightly gravelly sand and soft dark brown slightly gravelly clay with many rootlets. It was recorded in 41 exploratory locations including historical ones, and was typically 0.3m thick. Locally within TP CLR002A in the west of the scheme, Topsoil was noted as "peaty" with frequent rootlets. One historical location (NZ01SE3/E) recorded Topsoil with boulders and cobbles to 1.4m bgl.
- 6.2.8 Made Ground, described as Topsoil with stony clay and tarmac rubble or Topsoil with cobbles and boulders was recorded in four historical locations (NZ01SW60/A and NZ01SE3/F) from ground level to a maximum depth of 1.2m bgl. Made Ground was not encountered within holes from the 2021 ground investigation.
- 6.2.9 Glacial Deposits described as very clayey slightly gravelly sand with many rootlets were recorded in six locations from the 2021 ground investigation from ground level to 0.3m bgl, a description consistent with Topsoil or cultivated material.
- 6.2.10 Cohesive Glacial Deposits were present in all exploratory holes beneath Topsoil and Made Ground and typically comprised firm to stiff brown/ orangish mottled slightly sandy slightly gravelly clay with cobbles. Gravel and cobbles comprised mudstone, sandstone and limestone. The full thickness of the Glacial Deposits was proven within three boreholes in the west of the scheme only, and was found to be 9.4m to 15m thick and up to at least 20m thick elsewhere.
- 6.2.11 Granular Glacial Deposits were encountered in several locations comprising grey/ blue clayey gravelly sands and sands and gravels. Gravel comprised sandstone and mudstone. Boulders were encountered within the Glacial Deposits in the west and central areas of the scheme. Typically the Granular Glacial Deposits were present as layers of material within the Cohesive Glacial Deposits. Locally Granular Glacial Deposits were encountered at surface, and comprised materials of a similar description as Topsoil. Where proven, the thickness of Granular Glacial Deposits ranged between 0.4 to 2.1m thick.
- 6.2.12 Bedrock was encountered within three exploratory holes ranging between 9.4m and 15m bgl and comprised weak mudstone in BH CLR003 and BH CLR003A. In BH CLR004A, the bedrock was composed of interlaminated sandstone, siltstone and mudstone, and a 0.3m thick band of coal was present at 19.45m bgl.

- 6.2.13 Groundwater monitoring was carried out over a period of approximately 5 months following completion of fieldwork with 6 rounds of monitoring. Installations in the Glacial Deposits typically recorded stabilised levels at 1m to 6.5m bgl, with one installation in BH CLR003A consistently recording artesian conditions, which was likely to be influenced by the groundwater conditions at rockhead level several metres beneath. Multiple groundwater strikes were recorded during drilling in both historical and recent ground investigations. The depth of strikes ranged from as shallow as 2.2m bgl to 14.5m bgl in Glacial Deposits.
- 6.2.14 Summaries of laboratory and in-situ data available for each section are presented in sub-headings 6.3, 6.4 and 6.5 of this report. The plots summarised in Table 6.2-3 have been produced to support the interpretation of field and laboratory data. These are included in Appendix D.
- 6.2.15 Measured SPT N values have been corrected for energy losses, giving N_{60} values. Where no energy ratio is provided, for instance in historical holes, an energy ratio of 60% has been assumed
- 6.2.16 It is noted that some historical logs included laboratory test results, which have been included in the tables and figures included in this report.

Table 6.2-3: Scheme 8 - Geotechnical Figures

Figure Name	Figure Reference Scheme 8
Natural Moisture Content & Atterberg Limits	S8-1
Plasticity Chart	S8-2
PSD Grading Curves	S8-3
Particle Density	S8-4
SPT Value	S8-5
Undrained Shear Strength (GD-C)	S8-6
Oedometer (mv at stress increment)	S8-7
Compaction Test Curves	S8-8
Compaction Max Density vs. OMC	S8-9
MCV vs MC	S8-10
CBR (top) vs MC	S8-11
CBR (bottom) vs MC	S8-12
Plate Load Test	S8-13
Permeability In-situ	S8-14
Rock Moisture Content	S8-15
Rock Point Load - Axial	S8-16a
Rock Point Load - Diametral	S8-16b
Rock Point Load - Irregular Lump	S8-16c
Rock UCS	S8-17
Groundwater Monitoring	S8-18

6.3 Section 8.1 – Ch.59+450m to Ch. 60+300m

6.3.1 Exploratory holes relevant to this section are given in Table 6.3-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:

- Topsoil
- Made Ground
- Glacial Deposits – Cohesive
- Mudstone

Table 6.3-1: Section 8.1 - Relevant Exploratory Holes

Source/Date	Borehole ID	Type
Boreholes		
Durham County Council A66 Bowes By-pass (1975)	NZ01SW43	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW44	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW45	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW46	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW47	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW48	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW49	Cable Percussive
Durham County Council A66 Bowes By-pass (1975)	NZ01SW59	Cable Percussive
Allied Exploration Geotechnics Ltd, 2021.	WS CLR003	Windowless Sampling Hole
Allied Exploration Geotechnics Ltd, 2021.	BH CLR003	Cable Percussive with Rotary Follow On.
Allied Exploration Geotechnics Ltd, 2021.	BH CLR003A	Cable Percussive with Rotary Follow On.
Trial pits		
Allied Exploration Geotechnics Ltd, 2021.	TP CLR002	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR005	Trial Pit
Durham County Council A66 North Bitts to Greta Bridge (1983)	NZ01SW60/A	Trial Pit

Topsoil

6.3.2 Topsoil was recorded at ground level in 14 exploratory hole locations, including historical locations. In BH CLR003, in the east of this section, surface material was recorded as Granular Glacial Deposits, described as 'brown very clayey slightly gravelly sand with many rootlets'. It is likely the material being described is similar, although some differences may arise where surface materials are either ploughed material or 'intact' Topsoil.

6.3.3 The Topsoil was typically 0.25m thick, with a maximum thickness of 0.4m. Where full engineering descriptions are available (2021 locations) it was typically described as slightly sandy organic clay with rootlets.

6.3.4 A summary of testing data available for Topsoil is presented in Table 6.3-2 below.

Table 6.3-2: Section 8.1 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	4	18-45	30.3	29
Liquid Limit (%)	3	43-49	45	44
Plastic Limit (%)	3	18-28	23	23
Plasticity Index (%)	3	21-25	22.3	21

Made Ground

- 6.3.5 One historical location (NZ01SW60/A) recorded 0.8m of Made Ground described as Topsoil with tarmac rubble and chipping. This location is on the existing A66 main alignment which will have developed into its current arrangement since this investigation was carried out.
- 6.3.6 Further investigation is required along this section to inform the presence and type of Made Ground that may be present.

Glacial Deposits – Cohesive

- 6.3.7 Cohesive Glacial Deposits form the major superficial deposits and were recorded in all locations in this section. These were typically described as firm slightly sandy slightly gravelly or gravelly clay with low or medium cobble content becoming stiff with depth. Gravel was fine to medium or fine to coarse, subangular or subangular to subrounded predominantly of mudstone, sandstone and limestone, occasionally of metamorphic lithologies. Cobbles were also predominantly of mudstone, sandstone and limestone.
- 6.3.8 Boulders were recorded in four of the eleven historical locations which are all located on or near the existing A66 alignment. Boulders were also recorded in four of the five recent locations, with the exception of WS CLR003. High boulder content was recorded in TP CLR002 from 1.2 to 2m bgl and medium content in TP CLR005 from 0.7 to 2.4m bgl. These trial pits were located north and south of the A66 main alignment respectively. In BH CLR003 located 100m east of the scheme, Boulders were noted throughout the Cohesive Glacial Deposits to the termination depth of 13.2m bgl. In adjacent borehole BH CLR003A, which was carried out using rotary drilling, the Cohesive Glacial Deposits were described as clay and boulders to 11.5m depth, with a boulder recorded from 1.5 to 2.2m bgl and again from 10.6 to 11.5m bgl.
- 6.3.9 Soft clay was only recorded in one recent location, from 0.4 to 1.45m bgl in WS CLR003. Historical locations generally do not provide consistency information although where recorded the material is typically described as soft, for example NZ01SE3/B, NZ01SE3/C (to 1.3m bgl only) and NZ01SW59. All four of these locations are between approximately Ch. 60+180m and Ch. 60+310m. Due to the lack of consistency information available it is not possible to determine whether conditions vary across this section. It is noted that all soft material recorded is at relatively shallow depth.
- 6.3.10 The thickness of the Cohesive Glacial Deposits was only proven in BH CLR003 and BH CLR003A at the east of this section. Bedrock was encountered at 14.2 and 15.0m depth respectively at these locations.
- 6.3.11 A summary of testing data available for Cohesive Glacial Deposits is presented in Table 6.3-3 below.

Table 6.3-3: Section 8.1 - In-situ and Laboratory Test Results for Cohesive Glacial Deposits

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle density (Mg/m ³)		2	2.66	2.66	2.66
Bulk Unit Weight (kN/m ³)		3	21.4-21.8	21.5	21.4
Natural Moisture Content (%)		53	8-25	16	15
Liquid Limit (%)		57	25-46	34	33
Plastic Limit (%)		57	12-23	16	15
Plasticity Index (%)		57	11-27	19	18
PSD		3	N/A	N/A	N/A
Strength					
SPT N value ¹		11	15 - >100	65	88
SPT N ₆₀ value ¹		11	16 - >100	62	78
Unconsolidated Undrained Triaxial c _u (kPa)		2	90-212	151	151
HSV (lab), c _u (kPa) ²		1	130	130	130
HSV (field - peak) c _u (kPa)		9	42-70	56	54
Compaction					
Lab CBR (%)		4 (2)	1.7-2.6	2.1	2.0
Compaction	Maximum dry density (Mg/m ³)	2	1.86-2.06	1.96	1.96
	OMC (%)	2	10-14	12	12
MCV from MCC (multi-point)		10 (2)	2.9-11.7	N/A	N/A
Compressibility					
Oedometer Test @100kPa	m _v (m ² /MN)	1	0.19	0.19	0.19
	C _v (m ² /yr)	1	4.1	4.1	4.1
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.					

Glacial Deposits – Granular

6.3.12 Granular Glacial Deposits were recorded within one recent exploratory hole (TP CLR005) at 0.3m bgl, comprising yellow brown very clayey sand and gravel with low cobble content. The Granular Glacial Deposit was 0.4m thick and directly underlain by Cohesive Glacial Deposits.

Table 6.3-4: Section 8.1 - In-situ and Laboratory Test Results for Granular Glacial Deposits

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
PSD	1	N/A	N/A	N/A

Mudstone (Alston Formation)

- 6.3.13 Bedrock was only proven at two locations to the east of this section in BH CLR003 and BH CLR003A. In BH CLR003, distinctly weathered extremely weak to very weak grey mudstone was encountered at 14.2m bgl. In the adjacent borehole BH CLR003A, weak black grey mudstone was recorded from 15m bgl to the base of the hole at 16.95m bgl. BH CLR003A terminated due to the borehole collapsing, attributed on the log to artesian groundwater.
- 6.3.14 Three SPTs were undertaken within the mudstone. In BH CLR003 SPTs were carried out at 14.2m bgl and 15.7m bgl, recording values of 44 and 62 respectively. One further SPT was undertaken in BH CLR003A at 16.45m bgl which reported an extrapolated N value of 66.

Table 6.3-5: Section 8.1 - In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Strength				
SPT N value ¹	3	44-66	57	62
SPT N ₆₀ value ¹	3	40-61	53	57
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values.				

Groundwater

- 6.3.15 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 6.3-6.
- 6.3.16 Where piezometers were installed, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 with a further round on 27 August 2021. Groundwater information is provided in Table 6.3 7 below and on Figure 8-18.

Table 6.3-6: Section 8.1 Groundwater Strikes Summary

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
NZ01SW48	3.5	208	2.3	209.2	-	Glacial Deposits – cohesive	
NZ01SW59	2.6	204.4	1.8	205.2	60	Glacial Deposits – cohesive	
BH CLR003	5.1	194.9	2.4	197.6	20	Glacial Deposits – Cohesive	
BH CLR003	15	185.0				Mudstone	Artesian water strike on pulling casing at ~15m bgl

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH CLR003A	14	186.2				Glacial Deposits – Cohesive	Heavy inflow

Table 6.3-7: Section 8.1 Groundwater Monitoring Summary

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH CLR003A	6.0m 19mm SPIE	-0.2 (200.5)	-0.2 (200.5)	-0.2 (200.4)	-0.2 (200.4)	-0.2 (200.4)	-0.3 (200.6)	Glacial Deposits – Cohesive	All rounds possibly Artesian water
WS CLR003	2.5m 19mm SPIE	0.8 (200.5)	0.8 (200.5)	1.0 (200.3)	0.9 (200.4)	0.9 (200.4)	1.2 (200.1)	Glacial Deposits – Cohesive	

- 6.3.17 Artesian conditions were encountered at rockhead (approximately 15.7m bgl) on pulling casing in borehole BH CLR003 and heavy inflow took place in BH CLR003A during drilling from 14m bgl, just above rockhead.
- 6.3.18 Monitoring at BH CLR003A to east of this section has recorded consistent artesian conditions, with groundwater gently overflowing the headworks at 0.2m above ground level. The installation is located with Cohesive Glacial Deposits although the conditions observed are likely to be influenced by the groundwater conditions at rockhead level several metres beneath.
- 6.3.19 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 6.3.20 Combined drains and kerbs are present along the existing carriageway and cut-off drains are proposed to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 6.3.21 There is very limited groundwater information along this section and further investigation is required. The current proposals do not include any cuttings within section 8.1, however shallow groundwater may constrain the proposed culverts. For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level.

6.4 Section 8.2 – Ch.60+300m to Ch. 62+000m

- 6.4.1 Exploratory holes relevant to this section are given Table 6.4-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
- Topsoil
 - Made Ground
 - Glacial Deposits – Cohesive
 - Glacial Deposits Granular
 - Mudstone
 - Interlaminated Sandstone, Siltstone and Mudstone

Table 6.4-1: Section 8.2 - Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Allied Exploration Geotechnics Ltd, 2021.	WS CLR 003	Windowless Sampler
Allied Exploration Geotechnics Ltd, 2021.	BH CLR001	Cable Percussive
Allied Exploration Geotechnics Ltd, 2021.	BH CLR001A	Cable Percussive with Rotary Follow on
Allied Exploration Geotechnics Ltd, 2021.	BH CLR003	Cable Percussive
Allied Exploration Geotechnics Ltd, 2021.	BH CLR003A	Cable Percussive with Rotary Follow on
Allied Exploration Geotechnics Ltd, 2021.	BH CLR004	Cable Percussive
Allied Exploration Geotechnics Ltd, 2021.	BH CLR004A	Cable Percussive with Rotary Follow on
Durham County Council, A66 North Bitts to Greta Bridge 1981	NZ01SE47	Cable Percussive
Durham County Council, A66 North Bitts to Greta Bridge 1981	NZ01SE3/C	Cable Percussive
Durham County Council, A66 North Bitts to Greta Bridge 1981	NZ01SE3/D	Cable Percussive
Durham County Council, A66 North Bitts to Greta Bridge 1981	NZ01SE3/F	Cable Percussive
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP CLR003	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR004	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR005	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR006	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR007	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR008	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR009	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR009A	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR010	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR011	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR012	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR013	Trial Pit
Durham County Council, A66 North Bitts to Greta Bridge 1981	NZ01SE3/E	Trial Pit
Durham County Council, A66 North Bitts to Greta Bridge 1983	NZ01SE4/B	Trial Pit
Durham County Council, A66 North Bitts to Greta Bridge 1983	NZ01SE4/C	Trial Pit

Topsoil

- 6.4.2 Topsoil was encountered in 18 of 26 exploratory holes, typically 0.3m thick, but was locally recorded as 1.1m thick in NZ01SE4/B.
- 6.4.3 Topsoil typically comprised dark greyish brown slightly sandy slightly gravelly organic clay with frequent rootlets. Locally Glacial Deposits were encountered at surface, however their description was consistent with a description of Topsoil.
- 6.4.4 A summary of testing data available for Topsoil is presented in Table 6.4-2 below.

Table 6.4-2: Section 8.2 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	6	16-44	34	38
Liquid Limit (%)	2	24-49	37	37
Plastic Limit (%)	1	28	28	28
Plasticity Index (%)	2	6-21	14	14

Made Ground

- 6.4.5 Made ground was encountered within NZ01SE3/F and E and comprised brown sandy Topsoil with dark grey firm stony clay and tarmac rubble, and Topsoil with boulders and cobbles (undefined) ranging from 1.2 to 1.4m bgl.
- 6.4.6 A summary of testing data available for Made Ground is presented in Table 6.4-3.

Table 6.4-3: Section 8.2 - In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	2	16-22	19	19

Glacial Deposits – Cohesive

- 6.4.7 Cohesive Glacial Deposits form the major superficial deposits and were recorded in all locations in this section. The full thickness of the Cohesive Glacial Deposits was proven within three exploratory holes (BH CLR003, BH CLR003A and BH CLR004A), ranging between 9.4m to 14.9m thick. BH CLR0001A located on higher ground to the north of the A66 encountered close to 20m of these deposits but the base was not proven.
- 6.4.8 The Cohesive Glacial Deposits were typically described as firm to stiff grey/brown sandy gravelly clay, and were locally described as soft at the top of the superficial deposits. Very soft deposits were described within NZ01SE3/D, NZ01SE3/E and NZ01SE3/F to between 2.1 and 3m bgl. This material comprised light brown/ light orange grey mottled very sandy “stony” clay. No SPT tests were undertaken within these historical holes. The deposits are generally shown to become stiff at approximately 2 to 3m bgl, see Figure 8-5.
- 6.4.9 Gravel was fine to medium or fine to coarse, subangular or subangular to subrounded predominantly of mudstone, sandstone and limestone, occasionally of metamorphic lithologies. Cobbles were also predominantly of mudstone, sandstone and limestone.
- 6.4.10 Boulders were recorded in five exploratory holes in the west of section 8.2, where fully described these comprised sandstone, mudstone and metamorphic lithologies. Boulders were encountered both at shallow depth within trial pits, and at depth within boreholes.

6.4.11 A summary of testing data available for Cohesive Glacial Deposits is presented in Table 6.4-4.

Table 6.4-4: Section 8.2 - In-situ and Laboratory Test Results for Cohesive Glacial Deposits

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle density (Mg/m ³)		6	2.64-2.66	2.65	2.65
Bulk Unit Weight (kN/m ³)		3	21.4-21.8	21.5	21.4
Natural Moisture Content (%)		41	7-31	18	19
Liquid Limit (%)		30	25-50	34	34
Plastic Limit (%)		30	12-24	18	18
Plasticity Index (%)		30	10-26	16	15
PSD		15	N/A	N/A	N/A
Strength					
SPT N value ¹		38	15 - >100	57	40
SPT N ₆₀ value ¹		38	16 - >100	55	36
Unconsolidated Undrained Triaxial c _u (kPa)		2	90-212	151	151
HSV (lab), c _u (kPa) ²		1	130	130	130
HSV (field – peak), c _u (kPa)		45	32-120	71	66
Compaction					
Plate Load Test, CBR (%)		7	1.0-3.7	2.1	1.4
Lab CBR (%)		10 (5)	1.2-2.6	1.8	1.7
Compaction	Maximum dry density (Mg/m ³)	6	1.93-2.08	2.02	2.03
	OMC (%)	6	10-13	11	10.25
MCV from MCC (multi-point)		26 (5)	1.7-16.2	N/A	N/A
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.					

Glacial Deposits – Granular

6.4.12 Granular Glacial Deposits were recorded within ten exploratory holes and none were recorded within historical boreholes.

6.4.13 The Granular Glacial Deposits were encountered at shallow depth between surface and 3.9m bgl. Where encountered at the surface, the deposits typically comprised brown very clayey slightly gravelly sand with many rootlets, similar to Topsoil. Granular Glacial Deposits encountered below surface were encountered locally across section 8.2 at TP CLR004, TP CLR008, TP CLR009A, TP CLR010, BH CLR004 and BH CLOR004A between 2.4 and 3.9m

bgl. The deposits typically comprised yellow/ brown slightly to very clayey gravelly sand. A boulder was encountered at 10.5m bgl within BH CLR003A.

- 6.4.14 The full thickness of Granular Glacial Deposits was proven to range between 0.3m and 1.8m.
- 6.4.15 Silt was recorded within TP CLR010 between 2.4m bgl and the base of the hole at 4.5m bgl.
- 6.4.16 Gravel typically comprised fine to coarse subangular to subrounded mudstone, sandstone and metamorphic lithologies.
- 6.4.17 A summary of testing data available for Granular Glacial Deposits is presented in Table 6.4-5.

Table 6.4-5: Section 8.2 - In-situ and Laboratory Test Results for Granular Glacial Deposits

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	1	26	26	26
Liquid Limit (%)	1	28	28	28
Plastic Limit (%)	1	19	19	19
Plasticity Index (%)	1	9	9	9
PSD	4	N/A	N/A	N/A
Strength				
SPT N value ¹	2	25 - >100	63	63
SPT N ₆₀ value ¹	2	21 - >100	61	61
Compaction				
Lab CBR (%)	10 (5)	0.8-2.7	1.8	1.7
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.				

Mudstone (Alston Formation)

- 6.4.18 Mudstone was encountered in BH CLR003 and BH CLR003A. In BH CLR003, distinctly weathered extremely weak to very weak grey mudstone was encountered at 14.2m bgl. In the adjacent borehole BH CLR003A, weak black grey mudstone was recorded from 15m bgl to the base of the hole at 16.95m bgl. BH CLR003 and BH CLR003A were terminated at 15.7m and 16.95m bgl due to the borehole collapsing, in BH CLR003 this was attributed to artesian water.
- 6.4.19 Three SPTs were undertaken within the mudstone. In BH CLR003 SPTs were carried out at 14.2m bgl and 15.7m bgl, recording values of 44 and 62 respectively. One further SPT was undertaken in BH CLR003A at 16.45m bgl which reported an extrapolated N value of 66.

Table 6.4-6: Section 8.2 - In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Strength				
SPT N value ¹	3	44-66	57	62

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
SPT N ₆₀ value ¹	3	40-61	53	57

¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values.

Interlaminated Sandstone, Siltstone and Mudstone (Alston Formation)

6.4.20 Interlaminated sandstone, siltstone and mudstone was encountered in BH CLR004A at 9.4m bgl with a 0.3m thick band of coal present at 19.45m bgl. The coal comprised weak black lustrous partially weathered coal. The materials comprised moderately weak to moderately strong partially weathered interlaminated sandstone, siltstone and mudstone.

Table 6.4-7: Section 8.2 – In-situ and Laboratory Test Results for Interlaminated Bedrock

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m ³)	2	24.13-25.08	24.61	24.61
Strength				
SPT N value ¹	4	44 - >100	68	64
SPT N ₆₀ value ¹	4	40 - >100	64	59
Rock water content (%)	1	10.8	10.8	10.8
UCS (MPa)	2	39.4-109	74.2	74.2
Point Load Index	28	0.1-3.2	1.3	1.1

¹ For SPT N₆₀/N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values.

6.4.21 Rock testing was carried out in BH CLR004A only in material described as moderately weak to medium strong interlaminated sandstone, siltstone and mudstone.

6.4.22 One rock moisture content test was carried out on a sample at approximately rockhead level and returned a value of 10.8%. Two additional samples at greater depth returned values of 2.4% and 3.3% as part of UCS testing.

Groundwater

6.4.23 Groundwater was observed in a number of exploratory holes. Water strikes and standing water levels are reproduced in Table 6.4-8.

6.4.24 Where piezometers were installed, water level variation was recorded over the course of 5 monitoring rounds between 31 March 2021 and 6 May 2021 with a further round on 27 August 2021. Groundwater information is provided in Table 6.4-9 below and on Figure 8-18.

Table 6.4-8: Section 8.2 Groundwater Strikes Summary

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH CLR001A	14.7	191.5				Glacial Deposits – Cohesive	Moderate inflow

Borehole ID	Depth of strike (m bgl)	Elevation of strike (mOD)	Depth rose to (m bgl)	Elevation rose to (mOD)	Time for reported rise (min)	Geology	Comment
BH CLR003	5.1	194.9	2.4	197.6	20	Glacial Deposits – Cohesive	
BH CLR003	15	185.0				Mudstone	Artesian water strike on pulling casing at ~15.7m bgl
BH CLR003A	14	186.2				Glacial Deposits – Cohesive	Heavy inflow
BH CLR004A	9.7	188.7				Sandstone	Moderate inflow
TP CLR008	2.7	195.2				Glacial Deposits – Granular	
NZ01SE3/D	2.2	199.4	1.6	200.0	60	Glacial Deposits – Cohesive	

Table 6.4-9: Section 8.2 Groundwater Monitoring Summary

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
BH CLR001A	15.5m 19mm SPIE	9.6 (196.7)	8.0 (198.3)	8.2 (198.1)	6.5 (199.8)	6.4 (199.9)	N/A	Glacial Deposits – Cohesive	
BH CLR003A	6.0m 19mm SPIE	-0.2 (200.5)	-0.2 (200.5)	-0.2 (200.4)	-0.2 (200.4)	-0.2 (200.4)	-0.3 (200.6)	Glacial Deposits – Cohesive	All rounds artesian water
BH CLR004A	4.0m 19mm SPIE	0.9 (197.5)	-0.2 (198.6)	0.9 (197.5)	0.8 (197.6)	0.8 (197.6)	0.9 (197.5)	Glacial Deposits – Granular	Round 2 possibly artesian water
WS CLR003	2.5m 19mm SPIE	0.8 (200.5)	0.8 (200.5)	1.0 (200.3)	0.9 (200.4)	0.9 (200.4)	1.2 (200.1)	Glacial Deposits – Cohesive	

- 6.4.25 Artesian conditions were encountered at rockhead (approximately 15.7m bgl) on pulling casing in borehole BH CLR003 and heavy inflow took place in BH CLR003A during drilling from 14m bgl, just above rockhead.
- 6.4.26 Monitoring at BH CLR003A has recorded consistent artesian conditions, with groundwater overflowing the headworks at 0.2m above ground level. The installation is located with Cohesive Glacial Deposits although the conditions observed are likely to be influenced by the groundwater conditions at rockhead level several metres beneath.
- 6.4.27 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.
- 6.4.28 Groundwater strikes were recorded at varying depths within the Glacial deposits from 2.2m to 14.7m bgl.

- 6.4.29 The available information indicates that the bedrock is saturated, with evidence of artesian water pressures in some locations. Water strikes and monitoring information within the superficial deposits indicates that shallow groundwater is likely.
- 6.4.30 Combined drains and kerbs are present along the existing carriageway and cut-off drains are proposed to intercept surface water run-off from natural catchments towards the proposed carriageway.
- 6.4.31 For the purposes of geotechnical design it should be assumed that groundwater levels are at or near ground level.

6.5 Section 8.3 – Ch.62+000m to Ch. 63+690m

- 6.5.1 Exploratory holes relevant to this section are given in Table 6.5-1 below, see also the summary table in Appendix C. These indicate the presence of the following geological strata:
- Topsoil
 - Made Ground
 - Glacial Deposits – Cohesive
 - Glacial Deposits – Granular

Table 6.5-1: Section 8.3 - Relevant Exploratory Holes

Source/Date	Borehole ID	Type
BOREHOLES		
Allied Exploration Geotechnics Ltd, 2021.	WS CLR005	Windowless Sampler
Allied Exploration Geotechnics Ltd, 2021.	WS CLR001	Windowless Sampler
Allied Exploration Geotechnics Ltd, 2021.	BH CLR010	Cable Percussive
Allied Exploration Geotechnics Ltd, 2021.	BH CLR011	Cable Percussive
TRIAL PITS		
Allied Exploration Geotechnics Ltd, 2021.	TP CLR015	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR001	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR023	Trial Pit
Allied Exploration Geotechnics Ltd, 2021.	TP CLR020	Trial Pit

Topsoil

- 6.5.2 Topsoil was encountered within five of the eight exploratory holes undertaken within section 8.3. Materials similar in description to Topsoil were also encountered within BH CLR0011. Topsoil materials typically ranged up to 0.3m thick and comprised dark brown slightly sandy slightly gravelly clay with rootlets. Materials within TP CLR015 were described as “peaty” organic clay with frequent rootlets.
- 6.5.3 A summary of testing data available for Topsoil is presented in Table 6.5-2.

Table 6.5-2: Section 8.3 - In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	3	29-42	34.7	33
PSD	1	N/A	N/A	N/A

Glacial Deposits – Cohesive

- 6.5.4 Cohesive Glacial Deposits form the major superficial deposits and were recorded in all locations in this section. The glacial cohesive deposits were proven to a depth of approximately 7m within BH CLR010 and BH CLR011. The full thickness of the Cohesive Glacial Deposits was not proven.
- 6.5.5 The Cohesive Glacial Deposits were typically described as firm to stiff brown slightly sandy slightly gravelly clay. Locally within TP CLR001 and TP CLR020 materials were described as soft at the top of the Glacial Deposits. Soft materials within TP CLR020 extended to 1.9m bgl. Cobbles were noted throughout the Cohesive Glacial Deposits.
- 6.5.6 A summary of testing data available for Cohesive Glacial Deposits is presented in Table 6.5-3, graphical data are presented as figures where applicable.

Table 6.5-3: Section 8.3 - In-situ and Laboratory Test Results for Cohesive Glacial Deposits

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Bulk Unit Weight (kN/m ³)		1	20.5	20.5	20.5
Natural Moisture Content (%)		13	13-29	28	22
Liquid Limit (%)		11	17-41	33	36
Plastic Limit (%)		11	14-23	19	18
Plasticity Index (%)		10	0-20	14	15
PSD		2	N/A	N/A	N/A
Strength					
SPT N value ¹		13	3 - >100	52	43
SPT N ₆₀ value ¹		13	3 - >100	49	37
Unconsolidated Undrained Triaxial c _u (kPa)		1	23	23	23
HSV (lab), c _u (kPa) ²		1	32	32	32
HSV (field), c _u (kPa)		21	45-120	75	52
Compaction					
Plate Load Test, CBR (%)		1	1.2	1.2	1.2
Lab CBR (%)		2 (1)	0.7-1.2	1.0	1.0
Compaction	Maximum dry density (Mg/m ³)	1	2.02	2.02	2.02
	OMC (%)	1	10.5	10.5	10.5
MCV from MCC (multi-point)		10 (2)	4.1-14.3	N/A	N/A
¹ For SPT N ₆₀ /N value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.					

Glacial Deposits – Granular

6.5.7 Granular Glacial Deposits were encountered within four of the eight exploratory holes undertaken within section 8.3. Granular deposits were thin in the west of the site, comprising surface/near surface deposits of sand. In the east of the scheme TP CLR020 encountered significant granular deposits from 1.9m bgl to the base of the hole at 4.5m bgl. These materials comprised bluish brown/ blue sand and gravel and very gravelly sand comprising sandstone, mudstone, limestone and metamorphic lithologies.

6.5.8 A summary of testing data available for Granular Glacial Deposits is presented in Table 6.5-4.

Table 6.5-4: Section 8.3 - In-situ and Laboratory Test Results for Granular Glacial Deposits

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.67	2.67	2.67
PSD	4	N/A	N/A	N/A
Compaction				
Lab CBR (%)	4 (2)	2.8-4.5	3.7	3.7
MCV from MCC (multi-point)	5 (1)	5-12.3	8.1	7.0
¹ HSV results are measured values and have not been corrected.				

Groundwater

6.5.9 One groundwater instrument was installed within section 8.3, as summarised within Table 6.3-6. Land access restrictions prevented monitoring beyond the first round.

Table 6.5-5: Section 8.3 Summary of Groundwater Monitoring

Monitoring Point	Depth and Type of Well	Monitoring rounds depth m bgl (level mOD)						Response Zone Geology	Comment
		Round 1	Round 2	Round 3	Round 4	Round 5	Round 6		
WS CLR001	2.0m 19mm SPIE	0.8 (166.2)	N/A	N/A	N/A	N/A	N/A	Glacial Deposits – Cohesive	Land access restrictions prevented further monitoring rounds

6.5.10 There is very limited groundwater information along this section and further investigation is required.

6.5.11 Groundwater monitoring works were undertaken in the summer and groundwater levels have the potential to be higher in wet and/or winter conditions.

6.5.12 Cut-off drains are proposed to intercept surface water run-off from natural catchments towards the proposed carriageway.

6.5.13 For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level.

6.6 Scheme 8 Geotechnical Parameters

6.6.1 This section of the report presents geotechnical site-wide parameters derived for the purpose of developing a suitable specimen design. The parameters are summarised within Table 6.6-7. These should be treated as preliminary and should be given further consideration during the PCF design stage 4. The rationale for determination of geotechnical parameters is explained below:

- For earthworks cuttings, stability considerations are paramount and assessment of shear strength parameters is required.
- For earthworks embankments, in addition to shear strength parameters and compressibility of the embankment material itself, similar properties of the soil below the proposed foundation level are required. Further, the materials used for embankment construction must be workable and compliant with the current Specification for Highway Works.
- For structure foundations, the compressibility characteristics and bearing capacity are primary concerns.

6.6.2 Geotechnical parameters for the strata encountered in exploratory holes located along the scheme have been derived from laboratory tests, literature sources and soil and rock descriptions. The methodologies used to derive these are outlined in Appendix B.

Topsoil

6.6.3 A summary of site-wide laboratory and in-situ data available for Topsoil is presented in Table 6.6-1. As Topsoil is not an engineering material, material properties have not been derived for this stratum.

Table 6.6-1: Scheme 8 – In-situ and Laboratory Test Results for Topsoil

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content (%)	12	16-45	33.5	34.5
Liquid Limit (%)	4	24-49	40	43.5
Plastic Limit (%)	3	18-28	23	23
Plasticity Index (%)	4	6-25	18.3	21
PSD	1	N/A	N/A	N/A

Made Ground

6.6.4 A summary of site-wide laboratory and in-situ data available for Made Ground is presented in Table 6.6-2. As Made Ground is not an engineering material, material properties have not been derived for this stratum.

Table 6.6-2: Scheme 8 – In-situ and Laboratory Test Results for Made Ground

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Natural Moisture Content %	2	16-22	19	19

Glacial Deposits – Cohesive

6.6.5 A summary of site-wide laboratory and in-situ data available for the Cohesive Glacial Deposits is presented in Table 6.6-3. Ground parameters are discussed below.

Table 6.6-3: Scheme 8 – In-situ and Laboratory Test Results for Glacial Deposits - Cohesive

In-situ/ laboratory test results		No. of tests	Range	Mean	Median
Classification					
Particle density (Mg/m ³)		8	2.6-2.7	2.66	2.66
Bulk unit weight (kN/m ³)		3	20.5-21.8	21.2	21.4
Natural Moisture Content (%)		80	7-31	19	19
Liquid Limit (%)		70	17-50	34	34
Plastic Limit (%)		70	12-24	17	17
Plasticity Index (%)		70	0-26	17	16
PSD		19	N/A	N/A	N/A
Strength					
SPT N value ¹		51	3- >100	56	40
SPT N ₆₀ value ¹		51	3- >100	53	37
Unconsolidated Undrained Triaxial c _u (kPa)		3	23-212	108	90
HSV(lab), c _u (kPa) ²		4	29-130	38	56
HSV (field), c _u (kPa) ²		69	32-120	72	66
Compaction					
Plate Load Test, CBR (%)		7	1.0–3.7	2.1	1.35
Lab CBR (%)		16 (8)	0.7-2.7	1.8	1.7
Compaction	Maximum dry density (Mg/m ³)	8	1.9-2.1	2.0	2.0
	OMC (%)	8	10-14	11.1	10.5
MCV from MCC (multi-point)		35 (7)	1.7-16.2	NA	NA
MCV (at NMC)		1	8.1	8.1	8.1
Compressibility and consolidation					
Oedometer Test	m _v (m ² /MN)	1	0.19	0.19	0.19
	C _v (m ² /yr)	1	4.1	4.1	4.1
¹ For SPT N/N ₆₀ value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.					

Classification

- 6.6.6 The bulk unit weight results indicate a typical value of 20 to 21kN/m³ for Cohesive Glacial Deposits across scheme 8. A value of 21kN/m³ is proposed considering these results, and with reference to guidance for similar materials in BS8002:2015 [38]
- 6.6.7 The A-line plot shows that the majority of the material in this stratum is clay of low or intermediate plasticity. The natural moisture content values plotted with Atterberg limits show

that the natural moisture content was typically close to the plastic limit. Shallower samples from less than 1m bgl recorded higher natural moisture content, closer to the liquid limit.

- 6.6.8 PSD tests carried out in this stratum recorded a median clay and silt content of 44% and a median sand and gravel content of 56%. Cobbles and boulders were only recorded in PSD tests in one sample from BH CLR011, however it is noted that coarse granular material is likely to be more prevalent in-situ than in recovered samples.
- 6.6.9 The median recorded particle density of 2.66 is considered appropriate for this stratum.

Shear strength

- 6.6.10 Of the 51 SPT tests completed, 19 did not reach full penetration with N values derived by extrapolation. It is likely that the majority of these tests were hindered by obstructions such as cobbles. One further test did not record any penetration after 50 blows and therefore extrapolation was not possible.
- 6.6.11 Measured SPT values N have been corrected for energy losses, based on the reported hammer energy ratio, giving N_{60} values. A 60% ratio has been assumed for historical holes.
- 6.6.12 There is no clear increase in SPT N_{60} below 2.5m bgl and therefore the median value of the tests that reached full penetration and extrapolated values up to 100, is considered appropriate for this stratum, SPT $N_{60} = 37$.
- 6.6.13 It is noted some lower N_{60} values are recorded at shallow depth, with four values less than 20 (3, 6, 10, and 16) recorded within the three window sampling holes at depths of 2.5m bgl or shallower, with an average of SPT $N_{60} = 8$.
- 6.6.14 The median PI is 16%, which gives $f_1 = 6.5$ according to Stroud (1975) [41]. Using a more typical value of 4.5 this corresponds to a c_u of approximately 150kPa in general or 35kPa at shallow depth (<2.5m bgl).
- 6.6.15 54 field hand shear vane tests within the top metre recorded results between 32 and 92kPa, with a median of approximately 60kPa. A further 15 field tests between 3 and 4m bgl recorded strengths greater than 120kPa, beyond the limit of the apparatus, apart from one reading of 118kPa.
- 6.6.16 Two vane tests carried out in the laboratory on an undisturbed sample from 1.2m bgl recorded values of 29 and 32kPa. Two further values from 10m bgl recorded values of 80 and 130kPa.
- 6.6.17 Two unconsolidated undrained triaxial tests carried out on samples from 1.2m bgl in BH CLR010 and BH CLR003 recorded values of 23 and 90kPa. A deeper sample from 10m bgl in BH CLR003 recorded a value of 212kPa.
- 6.6.18 Typical shear strength values of 40kPa from 0 to 2.5m bgl and 120kPa thereafter are recommended for this stratum.
- 6.6.19 The effective friction angle at a constant volume, $\phi'_{cv} = 27^\circ$, has been derived according to BS8002:2015 [38] based on a PI of 16%. At this stage a $\phi_{pk}' = 27$ is considered appropriate for this stratum.
- 6.6.20 $c' = 0$ kPa is considered appropriate for this stratum.

Consolidation and Compressibility/ Stiffness

- 6.6.21 One oedometer test has been carried out in BH CLR003. The m_v value of 0.19m²/MN from the 50-100kPa loading increment has been used to derive elasticity parameters as this is typical of the surcharge from a low embankment. This represents a medium compressibility clay, and is typical for firm glacial deposits that are present in the top 2.5m.
- 6.6.22 The equation described in Appendix B has been used to derive a drained elastic modulus for this stratum as follows:
- $$E' = 1/m_v = 5.3 \text{ MPa}$$
- 6.6.23 m_v can also be derived from SPT N_{60} value and plasticity index as discussed in Appendix B. It is noted that based on the median PI of 16% and the representative value of SPT $N_{60} = 8$

at shallow depth, this corresponds to $f_2 = 0.65$ and $m_v = 0.19\text{m}^2/\text{MN}$. This corresponds well to the value provided by the oedometer test for the 50 to 100kPa loading increment. Below 2.5m bgl the stiffness is anticipated to increase to at least 17MPa.

- 6.6.24 For larger strains associated with settlement/heave calculations a relationship of $E' = 250 \times c_u$ is also commonly adopted. This would result in $E' = 8.75\text{MPa}$ at shallow depth, increasing to 30MPa below 2.5m bgl.
- 6.6.25 A value of $E' = 5\text{MPa}$ is considered appropriate at this stage from 0-2.5m bgl increasing to 17MPa at 2.5m bgl.

Compaction

- 6.6.26 Laboratory CBR tests were carried out on the top and bottom of 8 samples from the 2021 ground investigation, values between 0.73% and 2.7% were recorded with a median value of 1.7%. Due to the tests being carried out under soaked conditions, these values represent a lower bound to the in-situ conditions that will be encountered on the scheme.
- 6.6.27 Seven in-situ Plate Load Tests were carried out at depths of 0.35 to 0.5m bgl. The equivalent CBR values derived from these tests ranged between 1.0 and 3.7. Low values of 1.0 to 1.4 were recorded in four locations, TP CLR001, TP CLR004, TP CLR006 and TP CLR008. In TP CLR001, the test was carried out at a relatively shallow depth (0.35m bgl) within a layer of organic clay which terminated at 0.4m bgl and may have contributed to the low result. The material at test depth in TP CLR008 was described as containing traces of rootlets, which may have led to a low result in an otherwise firm material.
- 6.6.28 Further consideration has been given to a potential relationship between CBR and plasticity index, as suggested in historical pavement design reference HD25/94 (DMRB, Volume 7, Section 2 Foundations). The derived plasticity index of 16% provides an indicative CBR value between 4 and 5%. The recorded in-situ CBRs are noted to be lower than the indicative range provided in HD25/94 [39], however, only a limited number of in-situ CBRs were undertaken. Further consideration to subgrade improvement is recommended.
- 6.6.29 Based on the recorded results, the material present at shallow depth appears to be variable with more low CBR values recorded than on scheme 7. Material with a higher CBR would be expected at greater depth.
- 6.6.30 The average optimum moisture content from compaction tests was 11%, with all values in the range of 10-14%. The median maximum dry density was 2.02 Mg/m^3 (19.8kN/m^3). This indicates that excavated material will be wet of optimum and will require drying or treatment before reuse.
- 6.6.31 The multi-point MCC (Moisture Condition Calibration) tests and single-point MCV test results show a clear correlation between MCV and moisture content. A single point MCV test at natural moisture content reported an MCV of 8.
- 6.6.32 A plot of all MCV results and moisture content (including single-point and multi-point test results) indicates that the OMC of 11% derived from compaction tests corresponds to an MCV of 12. It is noted that there is significant variability in the MCV test results at any given moisture content. No MCV testing was carried out at a moisture content of less than 12%. The MCV value corresponding to a moisture content of 11% has been derived from the extrapolated line of best fit through the available data.

Glacial Deposits – Granular

- 6.6.33 A summary of laboratory and in-situ data available for the Granular Glacial Deposits is presented in Table 6.6-4. Ground parameters are discussed below.

Table 6.6-4: Scheme 8 – In-situ and Laboratory Test Results Granular Glacial Deposits

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Particle density (Mg/m ³)	1	2.67	2.67	2.67
Natural Moisture Content (%)	1	26	26	26
Liquid Limit (%)	1	28	28	28
Plastic Limit (%)	1	19	19	19
Plasticity Index (%)	1	9	9	9
PSD	8	N/A	N/A	N/A
Strength				
SPT N value ¹	2	25 - >100	63	63
SPT N ₆₀ value ¹	2	21 - >100	61	61
Compaction				
Lab CBR (%)	2 (1)	2.8-4.5	3.7	3.7
MCV from MCC (multi-point)	5 (1)	5-12.3	8.1	7
¹ For SPT N/N ₆₀ value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values. ² HSV results are measured values and have not been corrected.				

Classification

- 6.6.34 No bulk density tests were carried out. A typical value of 21kN/m³ is proposed with reference to guidance for similar materials in BS8002:2015 [38].
- 6.6.35 One moisture content and one Atterberg limits test was carried out in a mixed material described as sandy slightly gravelly clay/ clayey very gravelly sand. The clay is of low plasticity.
- 6.6.36 Eight PSDs were carried out in this stratum. Sand and gravel content is recorded between 52% and 81% with the remaining material composed of clay and silt, apart from three locations (TP CLR009, TP CLR015 and TP CLR020) where cobbles content of 5% to 25% was recorded.
- 6.6.37 High clay and silt content (34% to 40%) was recorded in three samples from trial pits TP CLR010 and TP CLR020. The logged description in TP CLR010 was a clayey silt. In TP CLR020 it is likely that some cohesive material is present within predominantly granular strata.
- 6.6.38 Only one particle density test was carried out. The recorded value of 2.67Mg/m³ is considered appropriate.

Shear strength

- 6.6.39 Only two SPT tests were carried out in granular soil. One in BH CLR004 recorded an SPT N value of 25 in material described as a sandy slightly gravelly clay/ clayey very gravelly sand. Another in BH CLR004A did not reach full penetration.
- 6.6.40 There is insufficient data to derive the angle of shearing resistance from SPT tests. Due to the mixed nature of the material it has not been considered appropriate to derive the angle of shearing resistance according to the equation in BS8002:2015 [38] reproduced in Appendix

B. A value of $\phi' = 30^\circ$ is recommended, with consideration to the variability of the material and limited in-situ or laboratory data for this stratum.

- 6.6.41 Where in-situ hand shear vane tests were carried out, material was described in the logs as 'very clayey' granular material.

Stiffness

- 6.6.42 SPT N_{60} values were used to derive E' in accordance with Stroud (1989) in CIRIA 143 [43] based on a conservative assumed SPT N_{60} value of 10, as follows:

$$E' = 1 \times N = 10\text{MPa}$$

Compaction

- 6.6.43 One laboratory CBR test was carried out on a sample from TP CLR020 at 2m bgl (the sample was recorded as slightly sandy slightly gravelly clay within a granular stratum). The results on the top and bottom of the sample recorded a CBR of 2.8% and 4.5% respectively.
- 6.6.44 A multi-point MCC (Moisture Content Calibration) test was carried out on the same sample. MCVs of 5 to 12.3 were recorded at moisture contents of 12 to 18%. An MCV of 12.3 was recorded at the natural moisture content of 12%.

Mudstone

- 6.6.45 A summary of laboratory and in-situ data available for mudstone is presented in Table 6.6-5.

Table 6.6-5: Scheme 8 – In-situ and Laboratory Test Results for Mudstone

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Strength				
SPT N value ¹	3	44-66	57	62
SPT N_{60} value ¹	3	40-61	53	57
¹ For SPT N/ N_{60} value, range, mean and median are based on tests that reached full penetration or extrapolated uncorrected values up to SPT N = 100. See Figure 8-5 for full extrapolated values.				

- 6.6.46 Due to the limited information available and variability of the material is it not possible to derive parameters for this material.

Interlaminated Sandstone, Siltstone and Mudstone (Alston Formation)

- 6.6.47 A summary of laboratory and in-situ data available for the interbedded bedrock encountered in BH CRL004A is presented in Table 6.6-6.

Table 6.6-6: Scheme 8 – In-situ and Laboratory Test Results for Interlaminated Bedrock

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
Classification				
Bulk Unit Weight (kN/m^3)	2	24.13-25.08	24.61	24.61
Strength				
SPT N value ¹	4	44 - >100	68	64
SPT N_{60} value ¹	4	40 - >100	64	59
Rock water content (%)	1	10.8	10.8	10.8

In-situ/ laboratory test results	No. of tests	Range	Mean	Median
UCS (MPa)	2	39.4-109	74.2	74.2
Point Load Index	28	0.1-3.2	1.3	1.1

¹ For SPT N/N₆₀ value, range, mean and median are based on tests that reached full penetration or extrapolated values up to SPT N = 100. See Figure 8-5 for full extrapolated values.

6.6.48 Due to the limited information available and variability of the material is it not possible to derive parameters for this material.

Groundwater

6.6.49 Site-wide groundwater conditions have been discussed for each of the sections. There is very limited groundwater information along this section and further investigation is required.

6.6.50 For the purposes of geotechnical design, groundwater levels should be assumed to be at or near to natural ground level.

Summary of Ground Parameters for Scheme 8

6.6.51 Table 6.6-7 presents a summary of ground parameters proposed to inform the preliminary design along scheme 8.

Table 6.6-7: Scheme 8 – Summary of ground parameters

Stratum	Unit Weight	NMC	PI	c'	ϕ^1_{pk}	Cu	E'	UCS	mv
	kN/m ³	%	%	kPa	°	kPa	MPa	MPa	m ² /MN
Glacial Deposits - Cohesive	21	19	16	0	27	40 (<2.5m bgl) 120 (>2.5m bgl)	5.0 (0-2.5mbgl increasing to 17 below 2.5m bgl)	-	0.19
Glacial Deposits - Granular	21	26	-	0	30	-	10	-	-
Bedrock	Due to the limited information available and variability of the material is it not possible to derive parameters for bedrock.								

6.7 Scheme 8 Attenuation Ponds

6.7.1 Attenuation ponds are proposed as a means of attenuation and treatment of highways drainage only. The ponds will have a permanent water level of 0.5m and a stored water volume on top. Infiltration testing was undertaken at or close to a number of proposed attenuation ponds at the recommendation of the karst desk study [17]. During design development after the ground investigation, it was subsequently decided all ponds will be lined by clay or by synthetic liner to limit infiltration.

6.7.2 Ponds are predominantly, while not exclusively, in cut. Overland flow is unattenuated and drained via cut off ditches and filter drains.

6.7.3 The results of variable head permeability tests and soakaway tests are contained in Table 6.7-1 and Table 6.7-2 below.

Table 6.7-1: Scheme 8 - Variable Head Permeability Test Results

Hole ID (Zone)	Type of Well	Depth Range (m bgl)	Response Zone Geology	Reported Permeability (m/s)
BH CLR001A (8.2)	19mm SPIE	15-16	Glacial Deposits - Cohesive	3.14E+07
BH CLR003 (8.2)	19mm SPIE	5-7	Glacial Deposits - Cohesive	5.64E-06
BH CLR004A (8.2)	19mm SPIE	3-5	Glacial Deposits - Cohesive/Granular	4.09E-07
WS CLR003 (8.2)	19mm SPIE	1-3	Glacial Deposits - Cohesive	1.29E-06

Table 6.7-2: Scheme 8 - Soakaway Test Results

Hole ID (Zone)	Test Zone Depth (m bgl)	Test Zone Geology	Infiltration Rate (m/s)
TP CLR005 (8.2)	1.3-2	Firm to stiff dark grey mottled orange brown slightly sandy gravelly clay with medium cobble content	N/A
TP CLR006 (8.2)	1.4-2	Firm grey with orange mottling slightly sandy slightly gravelly clay Stiff to very stiff grey slightly sandy slightly gravelly clay with low cobble content	N/A
TP CLR009 (8.2)	1.2-2	Firm brown mottled grey slightly sandy to sandy gravelly clay with medium cobble content Firm brown and brownish grey sandy gravelly clay with medium cobble content	N/A
TP CLR020 (8.4)	1.1-2	Soft orangish brown very sandy slightly gravelly clay with low cobble and boulder content Bluish brown clayey sand and gravel	N/A
N/A - No infiltration rate calculated due to neither the 75% nor 25% effective depth levels reached during the test.			

6.7.4 Due to changes in scheme design the permeability test positions no longer correspond to pond locations. The soakaway test undertaken within TP CLR009 is the only one within the footprint of a proposed pond.

6.7.5 Further targeted ground investigation will be required to assess ground conditions and soil permeability at each pond location..

6.8 Scheme 8 Aggressive Ground Conditions

- 6.8.1 In order to assess how potentially aggressive the ground may be to buried concrete the results of the relevant testing have been assessed in line with the requirements of BRE Special Digest 1 [45].
- 6.8.2 The Design Sulphate Class and associated ACEC class have been derived on a scheme wide basis for the Cohesive Glacial Deposits only as no results are available for other strata.
- 6.8.3 The results of the assessment are summarised in Table 6.8-1 below. The oxidisable sulfides calculation indicates that pyrite is probably present as oxidisable sulphides are present in a concentration >0.3% in five of the 11 samples. Consequently the Design Sulphate Class and ACEC class have been provided for both undisturbed and disturbed material (excluding and including respectively the total potential sulphate that may result from oxidation following ground disturbance).

Table 6.8-1: Scheme 8 - Aggressive ground test results

Stratum	Characteristic Value					Design Sulphate Class	ACEC Class
	SO4 2:1 water/soil extract (mg/l) Characteristic value [No. of tests]	SO4 groundwater (mg/l) Characteristic value [No. of tests]	OS (%) Characteristic value [No. of tests]	TPS (%) Characteristic value [No. of tests]	pH Characteristic value [No. of tests]		
Glacial Deposit-Cohesive (disturbed)	300 [11]	0 [1]	1.6 [11]	1.7 [11]	6.9 [11]	DS-4	AC-4
Glacial Deposit-Cohesive (undisturbed)	300 [11]	0 [1]	-	-	-	DS-1	AC-1

- 6.8.4 One groundwater sample was taken from the installation in BH CLR003A. The response zone is located in Cohesive Glacial Deposits. Laboratory testing of this sample recorded a sulphate content of 14 mg/l.

6.9 Geotechnical Category of Scheme 8

- 6.9.1 With reference to CD622 [1] the scheme has been assessed as Geotechnical Category 2 as it “includes conventional types of geotechnical structures, earthworks and geotechnical activities, with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions”. No new information has come to light following the recent ground investigation that would change this classification.

7 Scheme 8: Cross Lanes to Rokeby– Geo-Environmental Model

7.1 Introductory Information

- 7.1.1 This section summarises the geo-environmental testing of soils encountered along the scheme as well as testing of groundwater and surface water samples. The analysis of this has enabled a preliminary assessment of the risks posed to human health and controlled waters by comparing the test results against screening values to provide an indication of relative levels of contamination present along the scheme. This approach is consistent with Stage 1 of the Environment Agency’s Land Contamination Risk Management (LCRM) [46]. This review also includes waste hazard classification of the samples analysed, and a discussion on potential waste disposal routes.
- 7.1.2 An assessment of the potential contamination sources on site was carried out within the PSSR [6]. This study was augmented by a review of the site history within the chapter 9 (Geology and Soils) of the PEIR [20].

7.2 Visual and Olfactory Evidence of Contamination

- 7.2.1 Made Ground was reported on four historical holes. No Made Ground was encountered during the recent investigation. Coal was identified at shallow depth as a tertiary gravel component within TP CLR009A alongside other bedrock lithologies such as sandstone and mudstone. It is likely that these lithologies have been deposited naturally within the glacial deposits and the coal encountered is not considered anthropogenic in origin due to the local presence of coal within the bedrock.

7.3 Chemical Testing Overview

- 7.3.1 The strategy for chemical testing was developed based upon consideration of the preliminary conceptual site model presented in the TAR [47], PSSR [6] and PEIR [20] and the materials encountered during the ground investigation.
- 7.3.2 Soil and water samples selected by the A66 NTP Integrated Project Team were sent to Derwentside Environmental Testing Services (DETS) under a subcontract arrangement with the ground investigation contractor AEG Ltd. for selected chemical analysis. The testing carried out on soil and water samples are summarised under sub-headings 7.4 to 7.7 below.
- 7.3.3 A full description of analytical suites and limits of detection are presented in Appendix E.

7.4 Chemical Testing – Soils

- 7.4.1 A total of 35 soil samples from exploratory hole locations relevant to scheme 8 were tested for a range of chemical determinands likely to be encountered on the site as a result of its current and historical land use and geological setting. A summary of soil chemical testing undertaken is presented in Table 7.4-1.
- 7.4.2 The samples tested were taken from depths ranging from 0.20 m bgl to 2.40 m bgl and from the range of soil types encountered in the exploratory locations. A list of soil samples subjected to chemical testing is contained in Appendix E.
- 7.4.3 Soil chemical analysis results are presented in Appendix E (Geoenvironmental Testing) of AEG’s Factual Report [38] included in Appendix J.

Table 7.4-1: Scheme 8– Summary of Chemical Testing in Soil Samples

No of Samples	Description	Notes
35	Suite E1a – Primary metals and metalloids	Comprises Arsenic, Boron (Water soluble), Cadmium, Chromium (total), Chromium (trivalent), Chromium (hexavalent), Copper, Lead, Mercury, Nickel, Selenium and Zinc.
35	Suite E2 – Inorganics	Comprises pH, Soil Organic Matter, Total Organic Carbon, Sulphate, Sulphide, and loss on ignition.
35	Suite E3 – CN/Phenol	Comprises Cyanide (free) and Phenols (total).
25	Suite E4a – Asbestos	Asbestos Presence and ID
25	Suite E4b - Asbestos	Asbestos Quantification
34	Suite E6a – TPH CWG	TPH CWG
34	Suite E6b – BTEX	Comprises Benzene, Toluene, Ethylbenzene, O-xylene, M-xylene, P-xylene and Methyl tert-butyl ether
34	Suite E7a – Speciated PAHs	USEPA 16 PAHS
4	Suite H – WAC	Inert Waste Landfill Schedule

7.5 Chemical Testing – Leachate

- 7.5.1 The Environment Agency Remedial Targets Methodology [48] states that pore water concentrations determined for samples with a 2:1 liquid/solid ratio are preferable for risk assessment purposes with the 10:1 liquid/solid ratio leachate preferred for waste characterisation.
- 7.5.2 Samples selected to undergo Waste Acceptance Criteria (WAC) analysis were subject to leachate preparation using method BS EN 12457-3 [49] which involves a 2 stage leaching process (a moisture corrected 2:1 liquid to solid ratio leaching step for 6 hours followed by a moisture corrected 8:1 liquid to solid ratio leaching step on the remaining material for 18 hours). The combined results from which are calculated to provide analytical data reported as mg/kg dry weight at 10:1.
- 7.5.3 A total of 4 soil samples from exploratory hole locations were also subjected to leachate preparation and analysis to ascertain the mobility of substances in the soil. A summary of leachate analysis undertaken is presented in Table 7.5-1.
- 7.5.4 The samples tested were taken from depths ranging from 0.20 m bgl to 1.20 m bgl and from the range of soil types encountered in the exploratory locations. A list of leachate samples scheduled for analysis is contained in Appendix E.
- 7.5.5 Leachate chemical analysis results are found in Appendix E (Geoenvironmental Testing) of AEG's Factual Report [38] included in Appendix J.

Table 7.5-1: Scheme 8– Summary of Chemical Testing in Leachate Samples

No of Samples	Description	Notes
4	Electrical Conductivity / Total Dissolved Solids / Chloride / Fluoride / Sulphate / DOC	2:1 & 8:1 Leachable
4	Metals (Antimony, Arsenic, Barium, Cadmium, Copper, Chromium, lead, Mercury, Molybdenum, Nickel, Selenium, Zinc)	2:1 & 8:1 Leachable
4	Phenols	2:1 & 8:1 Leachable

7.6 Chemical Testing – Groundwater and Surface Water

7.6.1 One groundwater sample was recovered from the monitoring wells installed during the scheme 8 ground investigation. The locations of the monitoring wells are presented within drawings 565627-AMY-HGT-S08-DR-CE-100001-10 in Appendix A and a summary of the groundwater sampling locations are presented in Table 7.6-1.

7.6.2 Groundwater monitoring wells were purged of three well volumes of groundwater (unless indicated otherwise on the monitoring results) on the first of six groundwater monitoring rounds undertaken between 30 March 2021 and 27 August 2021.

Table 7.6-1: Scheme 8– Summary of Groundwater Samples

Expl. Hole	Response Zone Depth (m bgl)	Screened Horizon
BH CLR003A	5.00-7.00	Glacial (Clays)

7.6.3 All groundwater and surface water samples were subjected to a full suite of chemical analysis as presented in Table 7.6-3.

7.6.4 Two surface water samples were recovered from key sampling points on surface waters located within scheme 8 on the 30 March 2021. The locations of the surface water sampling points are presented within drawings 565627-AMY-HGT-S08-DR-CE-100001-10 in Appendix A and a summary of the surface water sampling locations are presented in Table 7.6-2.

Table 7.6-2: Scheme 8– Surface Water Sampling Locations

Surface Water Sampling point	Sample point Co-ordinates (NGR)	Watercourse
SW SLR001	405048E,513689N	Tutta Beck, minor tributary to River Tees and River Greta
SW SLR002	406732E,513481N	Tutta Beck, minor tributary to River Tees and River Greta

7.6.5 Groundwater chemical analysis results are found in Appendix E (Geoenvironmental Testing) of AEG's Factual Report [38] included in Appendix J.

Table 7.6-3: Scheme 8– Summary of Chemical Testing of Groundwater and Surface Water Samples

Test Suite	Groundwater Sample	Surface Water Sample
Metals and Metalloids (F1a)	1	2
Major Ions (F2)	1	2
Ammoniacal Nitrogen (F3)	1	2

Test Suite	Groundwater Sample	Surface Water Sample
Total Suspended Solids (F5)	1	2
Oxygen Demand (F6)	1	2
TPHCWG (F7a)	1	2
BTEX (F7b)	1	2
Speciated PAHs (F8)	1	2
Phenols and Cyanides (F10)	1	2

7.7 Groundwater Level and Ground Gas Monitoring

- 7.7.1 No potentially significant sources of ground gas were identified within the PSSR [6].
- 7.7.2 No Made Ground was encountered across the 35 exploratory locations for the scheme. No highly organic materials were encountered in natural strata and whilst a thin band of coal was encountered at depth in BH CLR004a it is not considered thick or laterally continuous. Therefore the site is considered to have no gassing potential and therefore no ground gas monitoring was undertaken for this scheme.
- 7.7.3 Groundwater levels were recorded at weekly intervals on five occasions, undertaken between 31 March 2021 and 27 August 2021.
- 7.7.4 The Monitoring and Post Fieldwork Environmental Sampling Methodology is set out in section 3.5 of AEG's Factual Report [38] included in Appendix J.
- 7.7.5 The results of the groundwater level monitoring, together with the temporal (weather) conditions are tabulated in AEG's Factual Report [38] included in Appendix J.
- 7.7.6 Artesian water conditions were noted during the investigation at BH CLR003 at approximately 15m bgl. Possible artesian water conditions have been recorded during the monitoring period at BH CLR003A and BH CLR004A. The groundwater level monitoring results are summarised in Table 7.7-1.

Table 7.7-1: Scheme 8– Groundwater Monitoring Results

Expl. Hole	Response Zone Depth (m bgl)	Screened Horizon	Water Level Range (m bgl)	Water Level Range (mOD)
BH CLR001A	15.00 - 16.00	Glacial (Clays)	7.96 – 9.57	196.68 – 199.88
BH CLR003A	5.00 – 7.00	Glacial (Clays)	-0.22 – -0.20	200.44 – 200.46
BH CLR004A	3.00 – 5.00	Glacial (Limestone boulder / Clays)	-0.16 – 0.89	197.51 – 198.55
WS CLR001	1.50 – 2.50	Glacial (Clays)	0.76	200.49
WS CLR003	1.00 – 3.00	Glacial (Clays)	0.79 – 0.95	200.33 – 200.49

7.8 Human Health Assessment – Site End Users

- 7.8.1 Key potential sources of contamination have been identified and discussed in the PSSR [6] and PEIR [20]. To enable a preliminary human health risk assessment, suitable Generic Assessment Criteria (GAC) have been selected for comparison with the chemical test results obtained from soil samples.
- 7.8.2 The Human Health Risk Assessment (HHRA) risk assessment methodology is outlined in Appendix F.

- 7.8.3 Soil Samples have been screened against GACs selected from the following strict hierarchy:
- Category 4 Screening Levels (C4SLs) as coordinated by CL:AIRE on behalf of the Department for Environment, Food and Rural Affairs [51];
 - LQM/CIEH Suitable 4 Use Levels (S4UL) [52], where published C4SLs are not available; or
 - Atkins ATRISKsoil Soil Screening Values (SSVs) [53].
- 7.8.4 Following a review of default land use scenarios underpinning these models, the “Public Open Space – Park” (POSPark) land use, utilising 1% Soil Organic Matter (SOM) has been selected for use on this project. It is considered to be suitably precautionary for the proposed land use under consideration (i.e. major highway scheme with associated earthworks, structures road verge landscaping and ancillary features such as attenuation ponds etc) with regards to selection of critical receptor and behavioural exposure parameters.
- 7.8.5 The full analytical results addressed in this report are presented in Appendix E (Geoenvironmental Testing) of AEG’s Factual Report [38] included in Appendix J.
- 7.8.6 No samples were recorded as exceeding the POSPark assessment criteria. The screening of results are presented in Appendix H.

7.9 Asbestos Assessment

- 7.9.1 25 soil samples were screened for asbestos containing materials (presence and identification and quantification) as part of the laboratory assessment. Visual observations on site were also considered.
- 7.9.2 No asbestos was detected within any samples examined in the laboratory. No asbestos containing materials were observed during the investigation.

7.10 Human Health Assessment – Construction and Maintenance Workers

- 7.10.1 The study area comprises a major highway scheme with associated earthworks, structures road verge landscaping and ancillary features such as attenuation ponds etc, and it is unlikely the public will access the land along the scheme on a routine basis post development.
- 7.10.2 Therefore, the preliminary human health assessment is primarily aimed at identifying significant contamination issues that may impact the scheme design or affect project personnel who will perform the infrastructure upgrade works and subsequent maintenance.
- 7.10.3 Construction and maintenance workers are more likely to be at risk from acute (short term, high dose) exposure to contaminants within the soils during periods of episodic occupational exposure.
- 7.10.4 GACs are for the most part (with the exception of cyanide) protective of chronic (i.e., long term, low dose) exposure rather than the effects of acute exposure. In general, GACs which are protective of chronic exposure are orders of magnitude lower than those which are protective of acute exposure.
- 7.10.5 The results of the chronic exposure assessment undertaken within sub-heading 7.8 above are considered to be conservative when assessing risks posed to construction and maintenance workers on a site in an occupational exposure setting.
- 7.10.6 No exceedances were identified however the potential to come into contact with as of yet undiscovered contamination should be considered when assessing the risks posed to construction and maintenance workers in an occupational exposure setting. Mitigation measures such as a watching brief for contamination, and the implementation of Safe Systems of Work (SSoW), use of appropriate personal protective equipment (PPE) (e.g. gloves / overalls etc) and /or use of respiratory protective equipment (RPE) should be considered as necessary if contamination is encountered.

7.11 Controlled Waters Risk Assessment – Tier 1 Assessment

- 7.11.1 Leachate, groundwater, and surface water samples recovered and analysed in the course of the ground investigation have been assessed to identify potential risks to groundwater resources underlying the study area and to surface waters in the vicinity of the site.
- 7.11.2 The Controlled Waters Risk Assessment (CWRA) has been undertaken with an initial precautionary “Tier 1” assessment, followed by a more specific “Tier 2” assessment of any Tier 1 exceedances. The “Controlled Waters Risk Assessment Methodology” is set out in Appendix F.
- 7.11.3 The “Tier 1” Controlled Waters Risk Assessment has been undertaken using the lowest of available relevant Water Quality Standards (WQS) (i.e., Drinking Water Standards (DWS) or Environmental Quality Standards (EQS)).
- 7.11.4 The results of the Tier 1 Controlled Waters Risk Assessment screen are presented in Appendix H.
- 7.11.5 Where exceedances of “Tier 1” water quality standards are identified, a review can be undertaken to establish whether the sample can be advanced to a more detailed “Tier 2” review and assessment in accordance with the “Controlled Waters Risk Assessment Methodology” set out in Appendix H.
- 7.11.6 The samples which have failed “Tier 1” water quality standards are summarised in Table 7.11-1. Those samples which have failed Tier 1 have been progressed to “Tier 2” and are presented in Table 7.12-1.
- 7.11.7 Marginal exceedances were identified in BH CLR003A for ammoniacal nitrogen, acenaphthene, fluorene, Phenanthrene and Pyrene. All of which have been progressed to Tier 2 assessment.
- 7.11.8 Benzo(k)fluoranthene and chrysene were recorded as above the criteria in SW CLR002, and copper was recorded as above the adopted criteria in both SW CLR001 and SW CLR002. These exceedances have been progressed to a Tier 2 assessment.
- 7.11.9 Soil leachate tests identified two exceedances of copper, three exceedances of molybdenum, and one exceedance of mercury. Soil leachate tests do not simulate in-situ conditions and concentrations from soil leachate tests are considered conservative as they do not take account of variation in solubility, dilution and attenuation which may reduce the contaminant concentration along the flow path. Therefore, soil leachate concentrations often exceed water quality criteria. Due to this, the exceedances have not been progressed to a Tier 2 assessment but are qualitatively assessed under sub-heading 7.16.

Table 7.11-1: Scheme 8– Summary of Tier 1 WQS Failures.

Sample Location	Sample Type	Depth	Contaminant of Concern	Tier 1 WQS (1mg/l / 2µg/l)	WQS	Tier 2 Assessment
BH CLR003A	Groundwater	6.00	Ammoniacal Nitrogen	0.04 ¹	EQS	Yes
BH CLR003A	Groundwater	6.00	Acenaphthene	0.01 ²	LOD	Yes
BH CLR003A	Groundwater	6.00	Fluorene	0.01 ²	LOD	Yes
BH CLR003A	Groundwater	6.00	Phenanthrene	0.01 ²	LOD	Yes
BH CLR003A	Groundwater	6.00	Pyrene	0.01 ²	LOD	Yes
SW CLR002	Surface water	N/A	Benzo(k)fluoranthene	0.00082 ²	EQS	Yes
SW CLR002	Surface water	N/A	Chrysene	0.01 ²	LOD	Yes
TP CLR013	Leachate	0.20	Copper	1 ²	EQS	No

TP CLR020	Leachate	0.20	Copper	1 ²	EQS	No
TP CLR013	Leachate	0.20	Molybdenum	0.5 ²	LOD	No
TP CLR009	Leachate	1.20	Molybdenum	0.5 ²	LOD	No
TP CLR005	Leachate	1.20	Molybdenum	0.5 ²	LOD	No
TP CLR020	Leachate	0.20	Mercury	0.07 ²	EQS	No

7.12 Controlled Waters Risk Assessment – Tier 2 (Groundwater)

- 7.12.1 The results of the Tier 2 Controlled Waters Risk Assessment screen are presented in Appendix H.
- 7.12.2 The preliminary CSM identified the following controlled water receptors within 500m of the scheme:
- One tributary within the site boundary (Tutta Beck).
 - Both the underlying superficial deposits and bedrock are designated as Secondary A aquifers; and
 - Groundwater abstractions utilised for small private domestic and agricultural supply.
- 7.12.3 Samples which exceeded the Tier 1 screen have been identified in Table 7.12-1. These samples were then assessed based on more targeted criteria taken from the CSM.
- 7.12.4 Tier 2 assessment comprises a comparison against drinking water standards (where available) due to the identified private groundwater abstraction utilised for private and domestic use. Where DWS are not available EQS from Tier 1 have remained as the assessment criteria.
- 7.12.5 There are four exceedances of polycyclic aromatic hydrocarbons (PAHs) identified in BH CLR003A. Ammoniacal nitrogen was observed to not exceed the relevant drinking water criteria.

Table 7.12-1: Scheme 8 –Summary of Tier 2 Chemical Testing in Groundwater Samples

Expl. Hole	Contaminant of Concern	Tier 2 WQS (¹ mg/l / ² µg/l)	Screening Criteria Source	Result (¹ mg/l / ² µg/l)
BH CLR003A	Ammoniacal Nitrogen as N	0.5 ¹	DWS	0.042 ¹
BH CLR003A	Acenaphthene	0.01 ²	LOD*	0.03 ²
BH CLR003A	Fluorene	0.01 ²	LOD*	0.02 ²
BH CLR003A	Phenanthrene	0.01 ²	LOD*	0.03 ²
BH CLR003A	Pyrene	0.01 ²	LOD*	0.03 ²

Notes: * No DWS available.

7.13 Controlled Waters Risk Assessment – Tier 2 (Surface Water)

- 7.13.1 The preliminary CSM identified numerous water courses within 500m of the site. The closest water course and receptor to the scheme is the Tutta Beck, a minor tributary that is hydraulically linked to the River Tees and River Greta, and is located on site and parallel to the proposed scheme. The samples for the scheme were taken at key locations along this tributary.
- 7.13.2 Copper was observed to be marginally in exceedance at both monitoring locations. Chrysene was observed to be marginally above the criteria in SW CLR002. Whilst

benzo(g,h,i)fluoranthene is recorded as in exceedance, it should be noted that the limit of detection for this analyte is greater than the assessment criteria.

Table 7.13-1: Scheme 8– Summary of Tier 2 Chemical Testing in Groundwater Samples

Expl. Hole	Contaminant of Concern	Tier 2 WQS (1mg/l / 2µg/l)	Screening Criteria Source	Result (1mg/l / 2µg/l)
SW CLR001	Copper	0.001 ¹	EQS	0.0014 ¹
SW CLR002	Copper	0.001 ¹	EQS	0.0014 ¹
SW CLR002	Benzo(g,h,i)fluoranthene	0.00082 ²	EQS	0.01 ²
SW CLR002	Chrysene	0.01 ²	LOD*	0.02 ²

Notes * No EQS available

7.14 Re-use of Soils

- 7.14.1 Introducing a soil material re-use strategy will be consistent with National Highways' commitment to incorporate sustainable methods into the design of projects as outlined in GG103 [54]. The re-use of soil materials within the scheme will reduce quantities of material destined for landfill, waste generation, unnecessary costs, and unnecessary journeys.
- 7.14.2 In addition, the requirement to import fill materials (and associated costs) may also be reduced. This will assist with meeting National Highways' environmental sustainability goals, including minimising greenhouse gas emissions, reducing waste generation, using sustainably sourced materials, and being resource efficient and reflecting a circular approach to the use of materials.
- 7.14.3 Prior to excavations and re-use of the material, an appropriate re-use methodology and Materials Management Plan, and associated Verification Plan document, should be completed to enable the re-use of the material. The Verification Plan should identify how the placement of materials is to be recorded and the quantity of materials to be used, including a statement on how the use of the materials relates to the highway design. Verification testing results should be compared to re-usability criteria from a corresponding Series 600 Earthworks Specification and Verification Plan.

7.15 Indicative Waste Classification

- 7.15.1 If possible, it is preferable the scheme is designed to minimise volume of surplus soil materials which arise, or material can be re-used in preference to landfill disposal. However, it is recognised the project may not be able to re-use or retain all surplus materials on-site (due to programme, storage space or geotechnical requirements) and off-site disposal of a quantity of surplus soils may be unavoidable.
- 7.15.2 Waste classification is a two-stage process, with the first step comprising a hazard assessment of the soil quality data in line with the guidance set out in the Environment Agency: Guidance on the Classification and Assessment of Waste Technical Guidance WM3 document, to provide the likely LoW code. The second step comprises targeted testing of Waste Acceptance Criteria (WAC) to confirm the most appropriate landfill waste stream.
- 7.15.3 The Hazard and Waste Acceptance assessment methodology is outlined in Appendix G and The full HazWasteOnline™ reports [55] are presented in Appendix I.

Hazard Assessment

- 7.15.4 The HazWasteOnline tool [55] has been used to assess 7 Topsoil and 28 Glacial samples.
- 7.15.5 All samples were classified as "17 05 04 (soil and stones other than those mentioned in 17 05 03) Non-Hazardous Waste".

Waste Acceptance Criteria for Disposal

7.15.6 WAC testing identified that the majority of material may be suitable for inert landfill however four samples were unsuitable due to exceedances of Total Organic Carbon. A summary of WAC tests and waste classification is provided in Table 7.15-1.

Table 7.15-1: Scheme 8 –Waste Assessment

Sample ID	Depth (m bgl)	Stratum	Waste Classification	Landfill Stream
TP CLR013	0.20	Topsoil	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP CLR020	0.20	Topsoil	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP CLR009	1.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill
TP CLR005	1.20	Glacial	17 05 04 Non Hazardous Waste	Suitable for Inert & Non Hazardous Landfill

7.16 Conclusions and Recommendations

7.16.1 This section has provided a preliminary assessment of the potential land contamination conditions and risks to the proposed development. Overall, the assessment indicates there is low risk from land affected by contamination within scheme 8. A summary of the findings are presented below and recommendations for further work, where required.

Human Health

7.16.2 The preliminary human health risk assessment did not identify any exceedances of the assessment criteria and the risk to human health from contaminants in soils can be considered very low.

7.16.3 Whilst no exceedances were observed in the samples tested, unidentified contamination may be present. Additionally, artesian water conditions were observed at two locations which have the potential to bring dissolved phase contaminants in contact with site operatives, who are the main receptors during infrastructure upgrade works and subsequent maintenance works.

7.16.4 Site operatives should be advised that there is the potential to encounter soils and groundwater affected by contamination. Suitable PPE should be worn to protect workers from site specific hazards as described under the CIRIA R132 Guidance [56]. The primary risk for exposure from contaminants is via dermal pathways during construction works at the site, and therefore operatives should wear hand protection (nitrile gloves), long overalls (covering arms), and eye protection where necessary, in addition to standard PPE. Should olfactory or visual gross contamination be encountered on site it should be considered contaminated, work should cease, and a geo-environmental Specialists be consulted.

Controlled Waters

7.16.5 Ammoniacal nitrogen and PAHs; acenaphthene, fluorene, and phenanthrene were recorded in groundwater as above the Tier 1 assessment criteria in BH CLR003A. When further assessed against Tier 2 criteria that is protective of groundwater resources, only the PAHs' were exceeding their criteria. Whilst recorded as an exceedance, it should be noted that the criteria for these PAHs (limit of detection) are conservative. Furthermore, the exceedances are marginal and the concentrations recorded are unlikely to pose a significant risk.

7.16.6 Benzo(g,h,i)fluoranthene and chrysene were recorded SW CLR002 as marginally above assessment criteria appropriate for surface water. Copper was also observed to be marginally above assessment criteria in both SW CLR001 and SW CLR002. The assessment criteria for

- benzo(g,h,i)fluoranthene and chrysene are conservative, with the criteria for benzo(g,h,i)fluoranthene as below the limit of detection.
- 7.16.7 Ammoniacal nitrogen was observed to be below criteria protective of surface waters and whilst there is the likelihood of a hydraulic link between groundwater and surface waters, the concentrations observed in groundwater are likely to be greater due to a higher residency time and less potential for dilution.
- 7.16.8 No Made Ground was encountered across the scheme footprint and the surrounding land is recorded as primarily used for agricultural purposes. Therefore, there is no attributable source of contamination present in the soils impacting controlled waters within the area. Coal deposited by natural processes have been observed as tertiary components within superficial deposits with a discontinuous small band observed within the mudstone. There is the potential that the elevated PAHs may be attributed to the presence of coal however it also is possible that the exceedance is due to general diffuse pollution, attributed to the possible proximity to farm buildings and the existing A66.
- 7.16.9 Overall, the risk of contaminants migrating in groundwater is limited by the nature of the geological strata present. Glacials are present across much of the scheme which largely comprise of sandy gravelly clays. Whilst the glacial has some permeability through limited gravel bands, the clays are characteristically low in permeability and will reduce any migration of potential contaminants in groundwater to offsite receptors, such as the small-scale abstraction wells within the area.
- 7.16.10 Leachate testing identified exceedances of copper, molybdenum and mercury however, the proposed scheme will reduce the impact to controlled waters by incorporate positive drainage and hardstanding which will have a positive effect of reducing infiltration and leaching potential of soils.
- 7.16.11 No major excavations are proposed for Scheme 8 and the majority of the scheme will be constructed at grade or on embankment. It is unlikely that dewatering will be required however where artesian water has been observed there is the potential requirement for management during construction. It is recommended that further sampling of groundwater is considered to provide baseline monitoring for construction and to inform appropriate management options.

Material Re-use

- 7.16.12 The proposed scheme is unlikely to generate significant quantities of material from excavations. However, where excavations are required, the material has been assessed as suitable for disposal as Inert and Non-Hazardous Waste. Where possible, the scheme design and construction works should aim to minimise offsite disposal to landfill. The assessment indicates that the majority of material tested is likely to be chemically suitable for re-use. The re-use of materials should be undertaken in accordance with a Materials Management Plan (MMP) under CL:AIRE Definition of Waste Code of Practice (DoWCoP). The MMP should be developed by a competent person, agreed with the regulator and include the following:
- Appropriate soil reuse criteria which is both protective of human health and controlled waters;
 - Plans identifying where materials are to be excavated, stockpiled and re-used;
 - Cross referenced to and within the Earthworks Specification detailing geotechnical re-use parameters;
 - A suitable sampling regime for stockpiled material to be re-used;
 - Details of the landowner, designer, earthworks contractor and regulatory contacts;
 - Planning permissions relating to the site and a design description of certainty of use;
 - A strategy to identify and manage unidentified contamination;
 - Estimated volume of excavated materials and materials to be re-used;
 - Details for managing excess or out of specification materials; and
 - Details of a material tracking system and copies of the tracking/control forms to be used.
- 7.16.13 Additionally, a Verification Report will be required to be submitted to CL:AIRE to verify that materials have been placed in a safe and suitable manner. It is recommended that a

competent person is present during site works to monitor the movement and placement of materials as well as document the relevant criteria required for a Verification Report.

Waste Classification and Disposal

- 7.16.14 If material cannot be re-used, then it is preferable that soils are sent to a suitable soil recycling facility. If disposal to landfill is required, then the waste hazard classification suggests materials are likely to be non-hazardous. WAC testing indicated that most material would be suitable for disposal in an inert landfill.
- 7.16.15 Whilst no Made Ground was encountered within the scheme, there is potential for undiscovered Made Ground to be present in areas which have not been investigated. Further samples should be taken in accordance with BS10175:2011+ A1:2003 [57] where waste disposal is required to confidently classify the waste. Samples should be scheduled for chemical testing by a geo-environmental specialist and assessed following receipt of the results.
- 7.16.16 Relevant chemical test data along with material descriptions and LoW codes will need to be provided to the proposed landfill and confirmation sought as to the final classification and subsequent cost associated with disposal.

8 Package D - Ground Model Summary

8.1.1 The following section provides a ground model summary for individual earthworks and structures throughout Package D.

Table 8-1: Scheme 7- Ground Model Summary

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
Section 7.1								
Earthwork 1 – Cutting/ At-grade	50+000	50+700	Approx. Slope Crest Level (EB): 286 – 294.5mOD Approx. Slope Crest Level (WB): 287 – 292mOD Approx. Road Level: 285 – 289mOD				0 - 0.7	<i>TP BB001 BH BB002-7 WS BB002 NY91SE25-34 NY91SE44/A and D</i>
			Topsoil/ Subsoil	0	varies			
			Made Ground	0	varies	0 - 1.0		
			Glacial (Cohesive)	0.3 - 1.0	varies	1.0 - 8.4		
			Glacial (Granular)	1.2 - 2.9	varies	0 - 7.3		
			Bedrock	varies	278.8-288.2	>15.3		
Proposed Pond 1- to the south of the WB carriageway	50+200		No targeted ground investigation available. Pond depth: TBC (partial cut/partial embankment) Ground level anticipated 282-285mOD Anticipated ground conditions of topsoil/subsoil overlying Cohesive Glacial Deposits. Limestone bedrock in surrounding area noted at c.271mOD.				<i>TP BB005 (65m west)</i>	
Existing culvert S07-01 to be retained	50+220	50+220	Approx. Road Level: 285.5mOD Invert level: TBC				~0.5	<i>NY91SE31-32</i>
			Made Ground	0	285.5			
			Glacial (Cohesive)	~0.5	285.0	~4.2		
			Bedrock	~4.7	280.8	>0.75		
Structure 1 – New gravity retaining wall	50+225	50+280	Approx. Slope Crest Level (WB): 288 - 290mOD Approx. Road Level: 285.2mOD				0 - 0.3	<i>BH BB003 NY91SE28-29</i>
			Topsoil	0	varies			
			Made Ground	0	varies	0 - 0.4		
			Glacial (Cohesive)	0.3 - 0.4	varies	4.8 - >8.4		
			Bedrock	varies	278.8-283.3	>6.2		
Structure 2 – Clint Lane overbridge replacement	50+330	50+330	Clint Lane Level: 290mOD Approx. Road Level: 285.3mOD				0 - 0.4	<i>BH BB002-4 NY91SE27 NY91SE28 NY91SE29 NY91SE30</i>
			Topsoil	0	290			
			Made Ground	0	290	0 - 2.3		
			Glacial (Cohesive)	0.3-2.3	varies	4.8 ->8.4		
			Bedrock	varies	278.8- 287	>6.2		

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes
Structure 3 Existing retaining wall to be retained	50+420	50+470	Approx. Slope Crest Level (WB): 288.5mOD Approx. Road Level: 286mOD				NY91SE26
			Topsoil	0	288.5	0.3	
			Made Ground	-	-	-	
			Glacial (Cohesive)	0.3	288.2	0 - >4.6	
			Bedrock	varies	<283.3	Not proven	
Earthwork 2 – Cutting	50+700	50+750	Approx. Slope Crest Level(EB): 291mOD Approx. Road Level: 289mOD Approx. Underpass Level: 284mOD				BH BB007 TP BB001-2
			Topsoil/ subsoil	0	291	0 - 0.7	
			Made Ground	0	290.7	0 – 0.3	
			Glacial (Cohesive)	0.3 – 0.7	290.7	3.4 - >4.2	
			Bedrock	4.5- 5.3	286.5 - 287.3	>15.3	
Structure 4 – Lyndale Farm Underpass extension	50+750	50+750	Approx. Road Level: 289mOD Approx. Underpass Level: 284mOD				BH BB007-8 TP BB001-2 NY91SE24
			Made Ground	0	289	>5.0	
			Glacial (Cohesive)	-	-	-	
			Bedrock	1.7 - >5.5	285.7- 287.3	>15.3	
Section 7.2							
Earthwork 1 – Embankment	50+750	51+200	Approx. Road Level: 287.6 – 289.7mOD Approx. ground level (EB): 284.4 – 290mOD Approx. ground level (WB): 284.4 – 290mOD				NY91SE7- 8,15,16,22,23,44/ B BH BB007-12 TP BB001-4,6
			Topsoil/ subsoil	0	varies	0 – 0.7	
			Made Ground	0	varies	0 – 0.6	
			Glacial (Cohesive)	0.3 - 0.7	varies	1.6 - >4.5	
			Bedrock	varies	281.4- 287.3	>19.7	
Earthwork 2 – Cutting	50+750	51+000	Approx. Slope Crest Level: 288 – 290.3mOD Approx. Road Level: 283.5 – 289.5mOD				NY91SE20 NY91SE44/C BH BB007, 9 TP BB001-3 HDP BB001
			Topsoil/ subsoil	0	varies	0.3 – 0.7	
			Made Ground	-	-	-	
			Glacial (Cohesive)	0.3 – 0.7	varies	2.1- >4.4	
			Bedrock	varies	283.9- 287.8	>15.3	
Earthwork 3 – Cutting	50+750	50+900	Approx. Slope Crest Level: 286.5 – 289.5mOD Approx. Road Level: 284.0 – 289.5mOD				NY91SE21 NY91SE24 BH BB008
			Topsoil/ subsoil	0	varies	0.3 – 0.7	

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
			Made Ground	-	-	-		
			Glacial (Cohesive)	0.3 - 0.7	varies	2.9 - >3.3		
			Glacial (Granular)	3.3	varies	3		
			Bedrock	varies	285.6-287.2	>11.3		
Existing culvert S07-C02 to be retained	50+980	50+980	Approx. A67 Road Level: 284.4mOD Invert level: TBC					NY91SE16, 17,18 BH BB010-12 NY91SE44/B
			Made Ground	0	284.4	~0.5		
			Glacial (Cohesive)	~0.5	283.9	~4.1		
			Bedrock	0.4 – 3.0	281.4-284	>19.7		
Structure 1 – New Bowes junction underbridge	50+980	50+980	Approx. Road Level: 289.5mOD Approx. A67 level: 284.4mOD					BH BB010-12 NY91SE15-16
			Topsoil/ subsoil	0	289.5	0.3 – 0.7		
			Made Ground	0	varies	0 - 0.6		
			Glacial (Cohesive)	0.3 – 0.7	varies	>3.3		
			Bedrock	5.5 - 7.3	281.4-284	>19.7		
New culverts S07-C04, S07-C05, S07-C06	51+010	51+040	Approx. EB on slip level: 285mOD (S07-C04) Approx. Mainline level: 289.1mOD (S07-C05) Approx. WB off slip level: 284mOD (S07-C06) Invert levels: TBC					BH BB011,13-14 TP BB 004 NY91SE10
			Topsoil/ subsoil	0	varies	0 – 0.7		
			Made Ground	0	varies	0 – 0.5		
			Glacial (Cohesive)	0.3 - 0.7	varies	3.3 - >4.6		
			Bedrock	varies	281.1	>7.1		
Structure 2 – Existing Bowes Hall underpass to be infilled	51+020	51+020	Approx. Road Level: 289.3mOD Approx. Underpass Level: 284mOD					BH BB011 NY91SE15
			Made Ground	0	289.3	>5.0		
			Glacial (Cohesive)	5	~284.3	0 -> 3.3		
			Bedrock	0.6 -3.6	282.8-284.0	>14.4		
Earthwork 4 – Cutting	51+000	51+200	Approx. Slope Crest Level: 285 – 291mOD Approx. Road Level: 284.5 – 289mOD					TP BB004 & 6 BH BB013 NY91SE10
			Topsoil/ subsoil	0	varies	0 – 0.7		
			Made Ground	0	varies	0 5-0.4		
			Glacial (Cohesive)	0.3-0.7	varies	>4.6		
			Bedrock	varies	<282.8	Not proven		

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes
Proposed Pond 2 to the south of the westbound diverge.	51+050		No targeted ground investigation available. Pond depth: TBC (to be constructed in cut) Ground level anticipated at 282mOD Anticipated ground conditions of topsoil/subsoil overlying Cohesive Glacial Deposits. Mudstone bedrock in surrounding area noted between 281mOD to the north and 285mOD to the west.				<i>NY91SE19 (50m west) BH BB014 (50m north)</i>
Earthwork 5 - Embankment	51+200	51+300	Approx. Road Level: 286.2 -287.7mOD Approx. ground level (EB): 285.9mOD Approx. ground level (WB): 287.3mOD				<i>BH BB015 TP BB007 NY91SE6</i>
			Topsoil	0	varies	0.3	
			Made Ground	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	0.9 - >2.4	
			Bedrock	varies	283.6-285.4	>3.3	
Earthwork 6 – Side long ground	50+980	51+300	Approx. Slope Crest Level: 285.5 – 287.2mOD Approx. Road Level: 282.5 – 287.2mOD				<i>BH BB014 TP BB007 NY91SE7-8</i>
			Topsoil	0	varies	0.3	
			Made Ground	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	2.3->3.3	
			Bedrock	varies	281.1-283.6	>7.1	
Section 7.3							
Earthwork 1 – Cutting/ nominal cutting	51+300	51+600	Approx. Slope Crest Level (EB): 280 – 286.5mOD Approx. Slope Crest Level (WB): 280.5 – 287.5mOD Approx. Road Level: 279 – 286.2 mOD				<i>BH BB015-17 TP BB008 NY91SE5-6, NZ01SW15-16</i>
			Topsoil	0	varies	0.3	
			Made Ground	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	0.3- >1.7	
			Bedrock	varies	<278.4 - 285.5	>3.3	
Earthwork 2 – Cutting/ Embankment	51+600	51+700	Approx. Road Level: 279 -276.2mOD Approx. Ground Level (EB): 276 -280mOD Approx. Ground Level (WB): 276 -280mOD				<i>TP BB009 BH BB017 NZ01SW14-15 NZ01SW58</i>
			Topsoil	0	varies	0.3	
			Made Ground	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	0.5- >2.2	
			Bedrock	varies	270.8 -272	>14.4	
Proposed Pond 3 to the north of the eastbound carriageway	51+600		Approx. Ground Level (EB): 279 -282mOD Pond depth: TBC (partial embankment)				<i>TP BB008 (40m west) TP BB009 (25m south)</i>
			Topsoil	0	varies	0.3	
			Made Ground	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	0.3- >1.7	

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
			Bedrock	varies	<278.4 - 281.9	>0.6		
Structure 1 – Blacklodge Farm Underpass extension	51+700	51+700	Approx. Road Level: 276mOD Approx. Underpass Level: 270mOD					<i>BH BB018</i> <i>NZ01SW58</i>
			Made Ground	0	276	>6.0		
			Glacial (Cohesive)	-	-	-		
			Bedrock	4.0 – 5.2	270.8-272	>14.4		
Section 7.4								
Earthwork 1 – Embankment	51+650	52+200	Approx. Road Level: 266.0 – 278mOD Approx. Ground Level (EB): 264.5 – 271.0mOD Approx. Ground Level 254.5 – 273.5mOD					<i>BH BB018-21</i> <i>TP BB009 -11</i> <i>NZ01SW9, 11-14</i> <i>NZ01SW58</i>
			Topsoil	0	varies	0.3		
			Made Ground	0	varies	0.3		
			Glacial (Cohesive)	0	varies	1.2>4.1		
			Bedrock	varies	<260 - 272	Not proven		
Pond 4 to the south of the westbound carriageway	52+050		Approx. Ground Level (EB): 267.4mOD Pond depth: TBC					<i>NZ01SW10 (60m east)</i> <i>NZ01SW11 (40m north east)</i> <i>NZ01SW12 (40m west)</i> <i>TP BB011 (25m east)</i>
			Topsoil	0	267.4	0.3		
			Made Ground	0	267.4	0.3		
			Glacial (Cohesive)	0.3	267.1	>3.9		
			Glacial (Granular)	3.4	264	0 - 2.6		
			Bedrock	Not proven	<260	Not proven		
Culvert S07-C07 extension	52+165	52+165	Approx. Road Level: 266.3mOD Invert level: TBC					<i>NZ01SW9-10</i>
			Made Ground	0	266.23	~0.5		
			Glacial (Cohesive)	0.5	265.8	>3.7		
			Bedrock	Not proven	<260	Not proven		
Earthwork 2 – Nominal cutting/ nominal embankment	52+200	52+941	Approx. Road Level: 263.5 - 266mOD Approx. Ground Level (EB): 260.5 – 266mOD Approx. Ground Level (WB): 263.5 – 266.5mOD					<i>BH BB022-25</i> <i>TP BB013-14</i> <i>NZ01SW4,5,7-9</i> <i>NZ01SW17-19</i>
			Topsoil	0	varies	0.3		
			Made Ground	0	varies	0.3		
			Glacial (Cohesive)	0.3	varies	2- >16.6		
			Bedrock	varies	248.5- 252	>7.3		
Pond 5 to the south of the westbound carriageway	52+600		Approx. Ground Level (EB): 260mOD Pond depth: TBC					<i>BH BB025 (110 west)</i> <i>NZ01SW17 (30m north)</i> <i>NZ01SW18 (40m north)</i>
			Topsoil	0	260	0.3		
			Made Ground	-	-	-		
			Glacial (Cohesive)	0.3	259.7	>3.4		

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
			Bedrock	Not proven	Not proven	Not proven		
Section 7.5								
Earthwork 1 - Embankment	52+200	52+500	Approx. Connecting Road Level: 268 - 272mOD Approx. Ground Level (EB): 265 – 268mOD Approx. Ground Level (WB): 262 – 268mOD				0.3	<i>BH BB022-26</i> <i>TP BB012-13</i> <i>NZ01SW2,4-8</i>
			Topsoil/ subsoil	0	varies			
			Made Ground	-	-	-		
			Glacial (Cohesive)	0.3	varies	2.2-16.6		
			Bedrock	varies	248.5-254.8	>7.3		
Structure 1 – New East Bowes accom. overpass	52+400	52+400	Approx. Overpass Level: 270mOD Approx. Road Level: 265mOD				0.3	<i>BH BB23-24</i> <i>NZ01SW5</i>
			Topsoil/ subsoil	0	varies			
			Made Ground	-	-	-		
			Glacial (Cohesive)	0.3	varies	16.6		
			Bedrock	varies	248.5-251.1	>7.9		

Table 8-2: Scheme 8- Ground Model Summary

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
Section 8.1 Start of Scheme and Cross Lanes Junction								
Earthwork 1 – Embankment / at-grade	59+450	60+300	Approx. Road Level: 204.9 – 229mOD Approx. ground level (EB): 203 – 226mOD Approx. ground level (WB): 202.5 – 225.5mOD				0.3	<i>NZ01SW43-49</i> <i>NZ01SW60/A</i> <i>NZ01SW59</i> <i>NZ01SE3/B,C</i> <i>WS CLR003</i> <i>BH CLR003</i>
			Topsoil	0	varies			
			Made Ground	0	varies	0.8		
			Glacial (Cohesive)	0.3	varies	13.9- >4.5		
			Bedrock	Not Proven				
Earthwork 2 – Embankment , and at-grade	59+600	60+200	Approx. Road Level: 208.0 – 227.3mOD Approx. ground level (EB): 208.4 – 225.8mOD Approx. ground level (WB): 208.0 – 227.5mOD				0.3	<i>NZ01SW47, 48</i> <i>NZ01SW60/A</i>
			Topsoil	0	varies			
			Made Ground	0	varies	0.8		
			Glacial (Cohesive)	0.3	varies	0.3->3.7		
			Bedrock	Not Proven				

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes	
New Culverts S08-C01, S08-C02, S08-C03, S08-C04, S08-C05, S08-C06	59+960	60+100	<i>No targeted ground investigation available, nearest exploratory holes (NZ01SW47 and 48) located approximately 50m west and east. Ground levels are anticipated at 212mOD with thin topsoil overlying cohesive glacial materials.</i>					
Structure 1 – Cross Lanes Overbridge	59+930	59+930	Approx. Overpass pass Level: 218mOD Approx. Road Level: 212mOD					NZ01SW46-48
			Topsoil	0	varies	0.3		
			Glacial (Cohesive)	0.3	varies	0.3->3.7		
			Bedrock	Not Proven				
Proposed Pond 1	60+140		<i>No targeted ground investigation available, no nearby historical ground investigation.</i>					
Proposed Pond 2	60+250		<i>No targeted ground investigation available, no nearby historical ground investigation.</i>					
Section 8.2								
Earthwork 1 – Embankment	60+300	62+000	Approx. Road Level: 185.0 – 205mOD Approx. ground level (EB): 185.5 – 203.5mOD Approx. ground level (WB): 182.5 – 202.5mOD					NZ01SE3/C-F NZ01SE4/C WS CLR003 BH CLR003/ 3A TP CLR007-8, 10-13
			Topsoil/ subsoil	0	varies	0.3-1.1		
			Made Ground	0	varies	1.2		
			Glacial (Cohesive)	0.3-1.2	varies	>4.5 - 13.9		
			Glacial (Granular)	2.9- 3.9	varies	0.3 – 1.8		
			Bedrock	varies	185.5 (west of the scheme)	Not Proven		
New Culvert S08-C07	60+780	60+780	Approx. Road Level: 198.5mOD Invert level TBC					TP CLR008 NZ01SE3/E, F
			Topsoil	0	198.5	0.3		
			Made Ground	0	198.5	0-1.4		
			Glacial (Cohesive)	0.3-1.4	198.3-197.1	>3.5		
			Glacial (Granular)	2.4	195.2	>0.4		
			Bedrock	Not proven				
Proposed Pond 3	60+850		Approx. Ground Level: 196mOD Pond depth: TBC (partial cutting)					TP CLR009 TP CLR009A
			Topsoil	0	196	0.3		
			Glacial – Cohesive	0.3	195.7	1.4-2.5		
			Glacial – Granular	2.8	190.6	>1.8		
			Bedrock	Not proven				

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes
Proposed Pond 4	61+230		<i>No targeted ground investigation available, TP CLR010 and 011 located nearby, ground level anticipated at approximately 191mOD, with Glacial Deposits anticipated 0.3m bgl (191.4 – 191.6mOD).</i>				
Section 8.3a							
Earthwork 1 – At-grade/nominal cutting/embankment	62+000	63+690	Approx. Road Level: 138 – 185.5mOD Approx. ground level (EB): 138.0 – 185.5mOD Approx. ground level (WB): 138 – 183.0mOD				BH CLR010-011 WS CLR001 TP CLR023
			Topsoil	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	>7.25	
			Bedrock	Not proven			
Earthwork 2 – Cutting, at-grade	62+070	62+230	<i>Limited ground investigation available. Nearest holes (WSCLR005 – 50m east), TPCLR015- 50m west). Ground level anticipated 179mOD with thin topsoil overlying Cohesive Glacial Deposits</i>				
New Culverts S08-C08, S08-C09, S08-C010	62+090	62+180					
Structure 1 – Rokeby Junction Overbridge	62+120	62+120					
Proposed Pond 5	62+500		<i>No targeted ground investigation</i>				
Proposed Pond 6	63+200		<i>No targeted ground investigation</i>				
New Culvert S08-C011	62+540	62+540	Approx. Road Level: 155mOD Invert TBC				BH CLR010
			Topsoil	0	155	0.3	
			Glacial (Cohesive)	0.3	154.7	>7.3	
			Bedrock	Not proven			
New Culvert S08-C12	62+900	62+900	Approx. Road Level: 161.8mOD Invert Level TBC <i>No targeted ground investigation</i>				
Culvert S08-C13 extension	63+100	63+100	Approx. Road Level: 156.1mOD Invert Level TBC				BH CLR011 (50m west)
			Topsoil	0	156.1	0.3	
			Glacial (Cohesive)	0.3	155.8	>6.5	
			Bedrock	Not proven			
Section 8.3b							
Earthwork 1 – At-grade/nominal cutting/embankment	62+000	63+690	Approx. Road Level: 138 – 185.5mOD Approx. ground level (EB): 138.0 – 185.5mOD Approx. ground level (WB): 138 – 183.0mOD				BH CLR010-011 WSCLR001 TP CLR023
			Topsoil	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	>7.25	
			Bedrock	Not proven			

Description	Chainage start (m)	Chainage end (m)	Strata	Top Depth (m bgl)	Top Level (mOD)	Thickness (m)	Exploratory Holes
New Culvert S08-C08	62+180	62+180	Approx. Road Level: 191.8mOD Invert Level TBC <i>No targeted ground investigation</i>				
Proposed Pond 5	62+500		<i>No targeted ground investigation</i>				
New Culvert S08-C09	62+550	62+550	<i>No targeted ground investigation</i>				
Earthwork 2 – Cuttings	62+880	63+050	Levels of the proposed earthworks were unavailable at the time of writing.				BH CLR011 (50m east)
			Topsoil	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	>6.5	
			Bedrock	Not proven			
New Culverts S08-C10, S08-C11, S08-C012	62+880	63+050	Levels of the proposed earthworks were unavailable at the time of writing.				BH CLR011 (50m east), no targeted ground investigation
			Topsoil	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	>6.5	
			Bedrock	Not proven			
Structure 1 – Rokeby Junction Underbridge	63+050	63+050	Approx. Road Level: 157.3mOD Approx. Level of underpass 151mD				BH CLR011
			Topsoil	0	varies	0.3	
			Glacial (Cohesive)	0.3	varies	>6.5	
			Bedrock	Not proven			
Culvert S08-C13 extension	63+100	63+100	Approx. Road Level: 156.1mOD Invert Level TBC				BH CLR011 (50m west)
			Topsoil	0	156.1	0.3	
			Glacial (Cohesive)	0.3	155.8	>6.5	
			Bedrock	Not proven			
Proposed Pond 6	63+200		<i>No targeted ground investigation</i>				
Proposed Pond 7	63+200		<i>No targeted ground investigation</i>				

9 Geotechnical Risk Register

- 9.1.1 *CD622 [1]* requires development of a geotechnical risk register (GRR) from project inception, to identify particular risk to the project throughout its lifecycle. Each relevant risk is assessed to determine if it will happen (likelihood or probability). If it does, the potential impact on the project is evaluated. Both probability and impact are assessed on a scale of one to five, the value assigned then being based on experience and judgement. By multiplying the two values, a risk rating is determined.
- 9.1.2 Table 9-1 to Table 9-3 provide the means of evaluating the probability, impact and risk rating. The risk rating is then considered and given a risk classification to determine whether it can be tolerated. Appropriate action must be identified to eliminate the high risks and to mitigate those deemed tolerable.
- 9.1.3 Table 9-4 provides the risk register. This lists the geotechnical risks to the project, their likelihood, impact and initial risk rating. These risk ratings are then evaluated and classified and colour-coded accordingly. Mitigation measures are then identified in order to eliminate or reduce risks to a tolerable level.

Table 9-1: Geotechnical Risk Register - Impact description

Potential impact		
1	Minor	Minor damage or loss (no human injury)
2	Moderate	Moderate damage or loss (Slight injury or illness)
3	Serious	Substantial damage or loss (Serious injury or illness)
4	Major	Major damage or loss (Fatal injury)
5	Catastrophic	Catastrophic loss or damage (Multiple fatalities)

Table 9-2: Geotechnical Risk Register - Risk rating

	Likelihood	Impact				
		1 Minor	2 Moderate	3 Serious	4 Major	5 Catastrophic
1	Extremely unlikely	1	2	3	4	5
2	Unlikely	2	4	6	8	10
3	Likely	3	6	9	12	15
4	Extremely likely	4	8	12	16	20
5	Almost certain	5	10	15	20	25

Table 9-3: Geotechnical Risk Register - Risk classification

Risk classification	
Low (1 to 8)	Ensure assumed control measures are maintained and reviewed as necessary.
Medium (9 to 19)	Additional control measures needed to reduce risk rating to an acceptable level.
High (20 to 25)	Activity not permitted. Hazard must be avoided or measures applied to reduce risk to a tolerable level.

Table 9-4: Geotechnical Risk Register – Package - D

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
1	Damage to existing retaining walls.	Damage of retaining structures leading to reduced lifespan or instability.	5	3	15	<p>The location of existing walls has been determined through google street view. A walkover is still to be undertaken. Appropriate mitigating design undertaken.</p> <p>Limited number of walls identified from aerial/ google street photography review. No dry stone walls identified but these may be present below carriageway level.</p> <p>A retaining wall has been identified on scheme 7 WB in the vicinity of Clint Lane. No change currently proposed.</p> <p>Possible retaining dry wall at east end of scheme 7 WB, not anticipated to be significant. Coincides with area of East Bowes new junction.</p> <p>Along scheme 8 there is a retaining wall along Cross Lanes Farm shop.</p>	1	3	3
2	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure.	5	5	25	<p>Area cannot be avoided. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.</p> <p>Ground investigation undertaken in the vicinity of</p>	2	5	10

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
						existing and proposed culverts to understand ground conditions, however investigation not available at all culvert locations. Further targeted geotechnical and structural investigation is required to reduce residual risk further.			
3	Telecom lines.	Damage to utility.	5	2	10	Early discussions with Stats owner to determine protection measures if necessary, utility diversions undertaken. Locations to be confirmed and safe method of working to be implemented by Contractor.	1	2	2
4	Powerlines/ overhead services.	Damage to utility and injury to construction workers.	5	5	25	Early discussions with Stats owner to determine protection measures and if necessary, utility diversions undertaken. Location to be confirmed and safe method of working to be implemented by Contractor.	1	5	5
5	Water/ sewage mains.	Damage to utility and injury to construction workers.	5	2	10	Early discussions with Stats owner to determine protection measures and if necessary, utility diversions undertake. Location to be confirmed and safe method of working to be implemented by Contractor.	3	2	6

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
6	Fibre Optic Service. (scheme 8)	Damage to utility.	5	5	25	Early discussions with Stats owner to determine protection measures and if necessary, utility diversions undertaken. Location to be confirmed and safe method of working to be implemented by Contractor.	1	5	5
7	Landfill located to the north of the site. (scheme 7)	Potential for ground gas migration through the soil matrix to beneath the site into buildings affecting building occupants and/or migrations of ground gas into excavations affecting construction workers.	2	4	8	Demolition of Low Broats Farm buildings. No buildings proposed in the vicinity of the landfill. No confined spaces proposed. Potential for ground gas to be risk assessed during construction works. Contractor to adopt safe working practices and ensure gas monitoring is undertaken in any deep excavations.	2	2	4
8	Potential for dissolution features and natural cavities based on limestone in the area.	Potential for collapsing ground conditions.	5	5	25	Desk study - karst risk assessment [17] undertaken and no karst landforms identified. (Refer to ES Road Drainage and Water Environment chapter). Preliminary ground investigation undertaken did not identify any voids present. Depth of investigation were limited in some areas. Further targeted geotechnical investigation is	1	5	5

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
					25	required where load bearing structures and attenuation basins are proposed. Remedial measures may be required. Design works will need to take any voids and remediation into account.			5
9	Earthwork Defects.	Further deterioration of existing defects causing instability to carriageway.	5	5	25	Earthworks defects listed in the PSSR [6] and in Table 2.2-2. Geotechnical engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Allowance for further targeted ground investigation where required.	1	5	5
10	Risks associated with the historical development including disused railway line and associated station building. (scheme 7)	Historical land-use leading to potential impact from contamination including coal tar from highway construction, three historical garages, and ground gases. Potential historical structures e.g. foundations and other hard ground causing	3	3	9	PSSR [6] undertaken, including review of historical mapping to identify potentially contaminative land uses. Geo-environmental testing was undertaken as part of preliminary ground investigation on selected samples of material and risk to human health and the environment assessed. Further targeted geotechnical investigation is required at location of	1	2	2

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
		excavation difficulty.				potential sources of contamination now within design scope, to identify the scope of any remedial measures or additional health and safety controls. Best practice to be implemented during earthworks phases for appropriate excavation, stockpiling and re-use of materials.			
11	Embankment construction.	Unacceptable settlement.	4	4	16	Ground investigation undertaken at key embankment locations to inform design. Further targeted geotechnical investigation required. Consideration should be given for unexpected ground conditions, formation levels should be inspected prior to construction and soft spots removed and replaced. Embankment fill to be sourced and compacted in accordance with the SHW. Sequencing of works to be considered to allow settlement to take place during construction.	1	4	4
12	Embankment construction.	Soft ground at formation level.	4	4	16	Ground investigation undertaken at key embankment locations to	1	4	4

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
						inform design and characterise anticipated ground conditions. Further targeted geotechnical investigation required. Formation levels should be inspected prior to construction and soft spots removed and replaced. Consider ground improvement techniques to mitigate instability caused by underlying soft soils.			
13	Peat was encountered at approximate chainage Ch. 51 +975m between 0.17m and 0.54m bgl. (scheme 7)	High post construction settlement.	3	3	9	Peat appears to be very localised. Formation levels should be inspected prior to construction and soft spots/ peat deposits removed and replaced.	1	3	3
14	Embankment construction.	Shortfall in suitable site-won fill material for construction.	4	4	16	Review of material suitability to be undertaken based on ground investigation information. Use lime or other binders to improve site-won soils for use as fill.	1	4	4
15	Embankment Construction. (Scheme 7 eastbound diverge embankment.)	Limited space and so over steepened slope gradients required to accommodate earthwork within the available land take.	2	3	12	Current design allows for 1:3 slope angles. Where steeper angles are required undertake slope stability calculations to assess the effectiveness of alternative measures such	1	3	3

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
						as rock fill slopes; retaining walls, strengthened soils, etc.			
16	Formation of soil cuttings.	Slope instability requiring reduced slope angles and incurring greater 'land take'.	4	3	12	<p>Ground investigation has been undertaken at all key cutting locations with the exception of Cross Lanes junction.</p> <p>Slope stability assessment to be undertaken to establish cutting slope angles. Preliminary assessment using existing ground investigation data suggests that 1V:3H is likely to be achieved in all places, with steeper slopes potentially possible locally.</p> <p>Further targeted geotechnical investigation required.</p>	1	3	3
17	Drivability of sheet piles into Glacial Deposits.	Unable to drive sheet piles to the required embedment depth due to the presence of boulders or rockhead.	4	3	12	<p>Ground investigation has been undertaken at key structure locations, with the exception of Cross Lanes junction and Rokeby Junction.</p> <p>Shallow bedrock identified at all key structure locations in scheme 7.</p> <p>The glacial deposits were described as including cobbles and occasional boulders.</p>	4	3	12

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
18	Buried obstructions other than culverts e.g. existing foundations and shallow rockhead (scheme 7).	Obstruction during excavation works causing delay in programme.	3	3	9	Former railway at Bowes identified as part of desk study review and site walkover. Shallow rockhead encountered in areas of Scheme 7 along proposed carriageway level in cuttings between Ch. 50+550m – Ch. 50+650m and Ch.51+400m – 51+500m. Possible shallow bedrock also identified at proposed Ponds 2 and 3.	3	1	3
19	Aggressive ground conditions.	Sulphate attack on foundation concrete especially in Made Ground and Alluvium.	5	3	15	Ground investigation findings indicate potentially aggressive conditions within disturbed Glacial Deposits and disturbed mudstone. Buried concrete to be designed for the appropriate aggressive ground classification.	5	1	5
20	Shallow or perched groundwater including seepages from granular horizons within the Glacial Deposits.	Flooding or instability of excavations and slopes, water pressures behind retaining structures has implication for design.	4	5	20	Ground investigation undertaken shows relatively shallow groundwater encountered at location of proposed Lyndale Farm Underpass, Blacklodge Farm Underpass and East Bowes Accommodation bridge on scheme 7. On scheme 8 shallow groundwater was noted at S08-C05.	4	1	4

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
					20	Granular bands within glacial encountered at Lyndale Farm Underpass, Clint Lane Bridge (culvert) and S07-06. Trial pit sides at Blacklodge Farm Underpass recorded as unstable. Allowance for localised treatment of seepages encountered within cutting faces.			4
21	Existing structures over and across the A66	Additional load from online dualling affecting the structure and foundations of the underbridge. The overbridge at Clinton Lane is currently too narrow to accommodate a dual carriageway. Overbridge at Clint Lane Ch. 50+255m. Underbridge spanning over Bowes Road (a67) Ch. 50+750m	5	4	20	To be taken into account during the design phase. Redesign of structures and retaining walls will be required to accommodate road widening and changes located at approximate chainages Ch. 50 +665m and Ch. 50 +610m; and associated retaining walls. Additional load from online dualling affecting the structure and foundations of the underbridge. The overbridge is currently too narrow to accommodate a dual carriageway.	1	4	4
22	UXO	Finding or hitting UXO during construction.	2	5	10	Zetica unexploded bomb map identifies risk as low.	1	5	5

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
23	Glacial cohesive deposits wet of optimum	Unable to re-use excavated material as fill during earthworks.	4	4	16	Supplement existing ground investigation information with additional earthworks testing, targeted on potential sources of fill. Evaluate treatment options to maximise re-use of material and assessment of improvement due to different binders.	3	2	6
24	Sulphate bearing soils.	Potential to generate problems for construction if lime binders are used due to adverse soil chemistry.	4	5	20	Further ground investigation and laboratory testing to determine TPS on a site by site basis. Undertake soaked CBR tests at various % of lime content to determine swelling potential. Establish distribution of TPS vs depth and chainage.	4	2	8
25	Pond locations	Limited understanding of ground conditions at pond locations resulting in changes to design	2	5	10	Further targeted geotechnical investigation required at location of attenuation basins/ ponds. Establish presence of rock at shallow depth, type, karst potential and design measures required.	2	2	4
26	Ground Contamination	Potential harm to health of site end users, controlled waters and construction and maintenance workers.	3	3	9	Geo-environmental testing was undertaken as part of the preliminary ground investigation on selected samples of material and the risk to human health and the environment assessed.	2	3	6

Risk ID	Hazard	Consequence	Risk Rating Before Control			Mitigation	Residual Risk Rating		
			Likelihood	Impact	Risk		Likelihood	Impact	Residual Risk
					12	Cohesive glacial deposits will reduce any migration of potential contaminants in groundwater to offsite receptors. Appropriate control measures to be adopted during the works, including suitable PPE under CIRIA R132. Should olfactory or gross contamination be encountered on site work should cease and a geo-environmental specialist consulted.			8
27	Coal tar products in existing carriageway	Hazardous material (Class U2)	4	3	12	Road coring programme to ascertain presence and extent	4	2	8

10 Engineering Assessment

10.1 Scope and Objectives

- 1.1.1 In accordance with the requirements of CD622 [1] this chapter considers an Engineering Assessment of each scheme element providing a description and justification of the geotechnical options that have been considered in the schemes' development, and providing justified engineering reasoning for the options considered.
- 1.1.2 This chapter considers both earthworks and structures and any specialists geotechnical measures that may be considerate appropriate.
- 1.1.3 This chapter does not constitute a design, but a geotechnical appraisal.
- 1.1.4 Structures and earthworks are referenced in ascending chainage.

10.2 Scheme 7: Bowes Bypass

- 10.2.1 Scheme 7 covers between chainage Ch. 50+000m and Ch. 52+941m. The proposed alignment closely follows the existing A66 to the north of the village of Bowes, with the addition of a new adjacent eastbound carriageway to its north.
- 10.2.2 Alterations to the existing junction with the A67 are required between Ch. 50+500m and Ch. 51+600m. Changes to the junction comprise the construction of a new underbridge to carry the new eastbound carriageway over the A67 and new slip roads to connect the two roads.
- 10.2.3 Extension to the existing A66 earthworks is primarily proposed along this scheme with extension of embankments up to 5m high and cut back to cuttings up to 7m deep. A new embankment 8.8m high is also proposed to carry the East Bowes accommodation overpass. All side slopes are proposed at 1V:3H or slacker, with the exception of earthworks associated with the A67 eastbound off slip, where steeper slopes are required.
- 10.2.4 Changes and modifications of overbridges are required along the scheme. This includes replacement of Clint Lane overbridge and a new accommodation overpass at East Bowes. Extension and modifications of underpasses are also required, these comprise underpasses for Lyndale Farm, Bowes Hall and Blacklodge Farm. Foundations for structures are anticipated to comprise shallow foundations on bedrock or firm to stiff glacial deposits at this stage, however, piled foundations should not be discounted until the final loads are confirmed.
- 10.2.5 Attenuation pond drainage features are proposed across the scheme at several locations.
- 10.2.6 Based on the ground conditions encountered during the preliminary ground investigation significant settlements are not anticipated and those that do arise are likely to be substantially completed during the construction period without additional ground improvement provisions.
- 10.2.7 Reference should be made to HE565627-AMY-HGT-S07-DR-CE-200001-3 in Appendix A. These provide plan and longitudinal sections showing the proposed new road alignment, with the positions of relevant exploratory holes.
- 10.2.8 With reference to CD622 [1] and BS EN 1997-1 [2], the scheme has been assessed as Geotechnical Category 2 with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions.
- 10.2.9 Table 10.1 provides the summary of the proposals, ground conditions encountered along scheme 7. The proposals provided within the table were based on design model freeze E. Detailed information on the ground conditions and investigation locations at each feature are provided within chapter 8 of this report. This is subject to change dependent on any updates to the design from subsequent model freezes.

Table 10-1: Scheme 7 - Bowes Bypass – Engineering Assessment

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
SECTION 7.1 Ch. 50+000 to Ch. 50+750 Start of scheme to Lyndale Farm Underpass				
Earthwork 1 – Cutting/At-grade	A66 Mainline	50+000 to 50+700	<p>Thin topsoil/subsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles. Deposits described as soft to c.1.2m depth, locally as deep as 2.9m bgl in BH BB002.</p> <p>Between chainages Ch 50+500m and 50+700m granular glacial deposits described as clayey sandy GRAVEL were encountered at depth overlying bedrock.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 278.8 and 288.2mOD, rising to the east.</p> <p>Groundwater strikes recorded within glacial deposits at c. 2mbgl and 4mbgl recorded as moderate inflow, and within mudstone at c. 8.5mbgl. Monitored groundwater levels at 2 – 4mbgl (294 – 289mOD) within glacial deposits and 280mOD within Mudstone.</p>	<p>Widening of existing carriageway with minor modification to existing eastbound and westbound slopes via slackening and cut back.</p> <p>Proposed road level between 285 to 289mOD.</p> <p>Side slopes 1V:3H, max cutting depth of 7m. Road level between 285m and 289mOD, generally increasing eastwards.</p> <p>Potential for partial cutting within rock as rockhead levels may vary across the area.</p> <p>Crest filter drain over majority of cutting on north side and locally between Ch. 50+350m to Ch. 50+700m on south side. Where seepages are encountered, localised slope drainage measures may be required.</p> <p>Consideration of counterfort face drainage required during detailed design.</p>
Proposed Pond 1	South of A66 Mainline	50+220	<p>No targeted ground investigation, nearest holes indicate topsoil/subsoil overlying cohesive glacial deposits.</p> <p>Firm slightly peaty organic clay encountered between 1 – 1.6mbgl (274.3-273.7mOD) within hole 65m to the west.</p> <p>Limestone bedrock in surrounding area noted at c.271mOD (65m west).</p> <p>Soil infiltration testing undertaken nearby inconclusive, but indicates low permeability.</p>	<p>Existing ground level varies between 282 and 285mOD from south to north.</p> <p>Cut required in east of pond and bunding in south. Proposed levels TBC.</p> <p>Potential for organic materials within cut, and variable permeability of superficial deposits anticipated.</p>
Existing culvert S07-01 to be retained.	A66 Mainline	50+220	<p>Made ground associated with the existing road overlying glacial deposits comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE at 280.8mOD.</p>	<p>Existing 38m long culvert is to be retained with no modifications proposed.</p> <p>Invert level: TBC</p>
Structure 1 – New gravity retaining wall	A66 Mainline Westbound	50+225 to 50+280	<p>Thin topsoil or made ground overlying glacial deposits generally comprising stiff to very</p>	<p>New gravity retaining wall along westbound carriageway. A retained height of approximately 0.5m is anticipated. The wall will</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			<p>stiff sandy slightly gravelly CLAY with high boulder content.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 278.8 and 283.3mOD in the vicinity.</p> <p>Groundwater encountered within glacial deposits at 285mOD and mudstone at c 279mOD.</p>	<p>be located at the toe of an existing cutting to enable road widening.</p> <p>Gravity wall to be founded on glacial deposits.</p> <p>Potential requirement for imported Class 6N for wall backfill.</p>
Structure 2 – Clint Lane overbridge replacement	A66 Mainline	50+330	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Areas of thick made ground (up to 2.3m, 294mOD) associated with reworked glacial deposits at the top of the existing cutting</p> <p>Glacial deposits described as soft within one hole to 1.6mbgl, 287mOD, located at the top of existing cutting.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 278.8 and 287mOD to the south of the A66 and at 280.8mOD to the north.</p> <p>Groundwater encountered within glacial deposits at 285mOD and mudstone at c 279mOD.</p>	<p>Existing bridge is to be replaced. The design of the bridge was in abeyance at the time of writing with potential options comprising:</p> <ul style="list-style-type: none"> replacement of the bridge at its current position; replacement with a non-motorised vehicle bridge. <p>Clint Lane level c. 290mOD, A66 road level c. 285.3mOD</p> <p>Foundations are anticipated to comprise shallow foundations below A66 road level founded on rock or stiff glacial deposits.</p> <p>Potential for shallow groundwater.</p>
Structure 3 – Existing retaining wall to be retained	A66 Mainline Westbound	50+420 to 50+470	<p>Topsoil overlying glacial deposits described as silty CLAY with limestone and sandstone boulders.</p> <p>Rockhead was not proven by the ground investigation and is anticipated to be close to road level based on records some 80m away.</p>	<p>Existing retaining wall adjacent to bus stop at westbound carriageway to be retained. The wall is located at the toe of the cutting.</p>
Earthwork 2 – Cutting	A66 Mainline To the north of eastbound to extend Lyndale farm underpass	50+700 to 50+750	<p>Thin topsoil/subsoil overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Materials described as soft to 2.2mbgl (289mOD) within one hole.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 286.5 and 287.3mOD</p>	<p>Widening of existing A66 on its eastbound lane to form eastbound off-slip to A67 junction and to enable extension of Lyndale Farm underpass to the north at approximately 289mOD.</p> <p>Where soft deposits are encountered during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Rockhead anticipated below road level but at shallow depth.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Groundwater strikes encountered within glacial deposits at 289mOD. Monitored groundwater levels at 290mOD.	Side slopes 1V:3H, max cutting depth of 7m. Crest filter drain over cutting on north side. Where seepages are present, localised slope drainage measures may be required.
Structure 4 – Lyndale Farm Underpass extension	A66 Mainline	50+750	Made ground associated with the construction of the existing underpass, overlying bedrock. Rockhead was encountered as partially weathered weak MUDSTONE between 285.7 and 287mOD to the south of the A66 and at 287.3mOD to the north. Groundwater strikes encountered within glacial deposits at 289mOD. Monitored groundwater levels at 290mOD	The existing underpass is an in-situ concrete box that is to be extended in length from 35m to 59.6m (22.3m north and 2.3m south). The extension is likely to comprise concrete boxes with integral raft foundation and parallel freestanding wingwalls. As built records indicate the underpass was built in open cut. The formation level of the box culvert and its access is likely to be below rockhead levels. The invert level is at approximately 284mOD with a 1 in 60 fall to the south.
SECTION 7.2 Ch. 50+750 to Ch. 51+300 A67 junction				
Earthwork 1 – Embankment	A66 Mainline Eastbound	50+750 to 51+200	Topsoil/subsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles. Glacial deposits described as soft to the east of New Bowes Junction bridge to a maximum depth of 2.5m bgl (283.6mOD). Rockhead was encountered as partially weathered weak MUDSTONE between 281.4 and 287.3mOD, generally dipping to the east.	Widening of eastbound carriageway on embankment up to 5m in height. Localised upfilling required above existing A67 off-slip. Feature includes approaches to Bowes Junction Underbridge. A66 road level 287.6mOD to 289.7mOD. Embankment side slopes to be 1V:3H or slacker with the exception of Ch. 50+850m to Ch.50+950m where steeper slopes up to 1V:1.3H are required. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material. Requirement for site-won or imported Class 1 or Class 2 fill material. Rock fill shoulder required between Ch. 50+850m to Ch.50+950m.
Earthwork 2 – Cutting	A67 off-slip: Eastbound	50+750 to 51+000	Topsoil/subsoil overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles. Rockhead was encountered as partially weathered weak MUDSTONE between 283.9 and 287.8mOD, with rockhead generally dipping to the east.	Eastbound off slip of A66 to A67 junction. In new cutting up to 5m deep. Localised upfill required about existing access to Lyndale Farm Underpass between Ch. 50+750 to Ch. 50+800. Proposed road level 283.5 – 289.5mOD. Potential for cutting within rock in the east.

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Groundwater was encountered in the centre of the cutting within Mudstone at 5m bgl (285mOD). Monitored groundwater levels within Mudstone at c. 4mbgl (286mOD).	Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material. All cutting side slopes to be 1V:3H. Crest of southern slope to interact with embankment slopes of A66 mainline eastbound. Crest cut-off drain on north side. Where seepages are encountered, localised slope drainage measures may be required. Potential for shallow groundwater.
Earthwork 3 – Cutting	A67 on-slip: Westbound	50+750 to 50+900	Topsoil/subsoil overlying glacial deposits generally comprising firm to stiff with depth, slightly sandy slightly gravelly CLAY with cobbles and boulders. Rockhead was encountered as partially weathered weak MUDSTONE between 285.6 and 287.2mOD. Groundwater was encountered at 2.3mbgl and 2.8mbgl (283.8 to 289.3mOD) within glacial deposits.	Minor widening of existing carriageway and verge with modification to existing cutting slopes via slackening and cut back. Maximum depth of cutting 2m. Approximate road level 284 to 289.5mOD. Potential for partial cutting into rock in the east of the cutting. All cutting side slopes to be 1V:3H.
Existing culvert – S07-C02	A66 Mainline	50+980	Made ground associated with the existing road overlying thin glacial deposits comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles. Rockhead was encountered as partially weathered weak MUDSTONE between 281.4 and 284mOD.	Existing 55.4m long culvert is to be retained with no modifications proposed. Invert level: TBC
Structure 1 – New Bowes junction underbridge	A66 Mainline Eastbound	50+980	Topsoil/subsoil or made ground overlying thin glacial deposits (locally absent at existing A67 level). Rockhead was encountered as partially weathered weak MUDSTONE between 281.4 and 284mOD. Rock proven to 20mbgl, typically described as moderately weak to 7 to 11m bgl (275.4 to 271.7mOD), below which described as medium strong to strong fossiliferous grey LIMESTONE.	Existing Bowes underbridge being retained for westbound carriageway. A new 35m span bridge is proposed for the eastbound carriageway. Proposed A66 road level 289.5mOD, proposed A67 level 284mOD. Foundations anticipated to comprise shallow foundations founded on rock.
New culverts – S07-C04, S07-C05, S07-C06	A66 Mainline	51+010 to 51+040	Topsoil/subsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth,	Three new 1.5m diameter culverts are proposed through the on-slip ramp, existing underpass and

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			<p>slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE at 281mOD.</p> <p>Groundwater was monitored in the area at c 1.2 to 2.2m bgl (282.2 to 282.3mOD) within both mudstone and glacial deposits.</p>	<p>proposed off slip ramp at the A67 Bowes junction.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Ground bearing concrete boxes founded on firm-stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC.</p> <p>Potential for cutting into rock within S07-C05 and S07-C06.</p> <p>Potential for groundwater to be encountered within cuttings for culverts.</p>
Structure 2 – Bowes Hall Underpass to be infilled	A66 Mainline	51+020	<p>Made ground associated with the construction of the existing underpass, overlying thin glacial deposits over bedrock.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 282 and 284mOD</p>	<p>Existing underpass to be infilled or removed. As built records indicate the invert level is at approximately 284.1mOD.</p> <p>The existing underpass is an in-situ concrete box built in an embankment.</p> <p>A66 road level 289.3mOD.</p> <p>Infill materials to be specified to reduce potential for differential settlement.</p>
Earthwork 4 – Cutting	A67 on-slip: Eastbound	51+000 to 51+200	<p>Topsoil/subsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Materials described as soft to 2.2m bgl (288.0mOD) in the west of the cutting. Below this level, materials are typically described as firm to stiff.</p> <p>Rockhead was not proven by the ground investigation and is anticipated to be <282.8mOD.</p> <p>Groundwater was monitored in the west of the cutting within glacial deposits at 1.6 to 2.9mbgl (287.9 to 289.2mOD).</p>	<p>Eastbound on-slip of A66 from A67 junction. In new cutting up to 4m deep. Carriage way level c.284.5 to 289mOD</p> <p>Northern cutting side slopes to be 1V:3H. Southern slopes to be between 1V:4H and 1V:5H, and interact with embankment slopes of A66 mainline eastbound.</p> <p>Crest filter drain on north side of cutting. Where seepages are encountered, localised slope drainage measures may be required.</p> <p>Consideration of counterfort face drainage required during detailed design.</p>
Proposed Pond 2	South of A66 Mainline	51+050	<p>Anticipated ground conditions of topsoil/subsoil overlying cohesive glacial deposits.</p> <p>Rockhead was encountered as partially weathered weak MUDSTONE between 281 and 285mOD within 50m from the proposed pond location.</p>	<p>Existing ground level at approximately 282mOD. Nearby ground conditions indicate pond may be cut into bedrock.</p> <p>Pond to be formed in cut. Proposed levels TBC.</p> <p>Potential for shallow groundwater.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Nearby monitored groundwater levels relatively shallow at 1.3 – 2.2mbgl within cohesive glacial deposits.	
Earthwork 5 – Embankment	A66 Mainline	51+200 to 51+300	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Made ground comprises thin (0.15m thick) layer of soft dark sandy slightly gravelly CLAY with many rootlets and ceramic tile.</p> <p>Glacial materials described as soft to 2.5mbgl (283.6mOD) within TP BB007 located 75m west of embankment. Glacial materials locally include clayey GRAVEL.</p> <p>Rockhead was encountered as distinctly weathered extremely weak MUDSTONE between 283.6 and 285.4mOD.</p>	<p>Eastbound mainline and merging lane with the on-slip from A67 junction. Widening of existing carriageway with minor filling and low height slopes. A66 proposed at 286.2 to 287.7mOD.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Embankment side slopes to be 1V:3H.</p> <p>Requirement for site-won or imported Class 1 or Class 2 fill material.</p> <p>Cut-off drain at toe of northern embankment slope.</p>
Earthwork 6 – Side long ground	A67 off slip: Westbound	50+980 to 51+300	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Soft materials recorded to 2.5mbgl (283.6mOD), directly overlying extremely weak MUDSTONE within TP BB007 in the central area of the cutting.</p> <p>Rockhead was encountered as distinctly weathered weak MUDSTONE between 281.1 and 283.6mOD.</p>	<p>Westbound off slip from A66 to A67. Mainline A66 on low height embankment. East of slip road at existing grade, with low height embankment along westbound carriageway.</p> <p>In new cutting up to 3m deep. Approximate road level 282.5mOD to 287.2mOD.</p> <p>Northern cutting side slopes to be 1V:4H to 1V:5H. Southern side slopes to be 1V:3H.</p>
Section 7.3 Ch. 51+300 to Ch. 51+700 A67 junction to Blacklodge Farm Underpass				
Earthwork 1 – Cutting/ nominal cutting	A66 Mainline	51+300 to 51+600	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Glacial deposits described as soft to >2mbgl (<278.3mOD) within BH BB017 in the east of the cutting. Elsewhere, firm to stiff glacial deposits were encountered at c. 285mOD. The depth to firm to stiff materials is anticipated to vary throughout the cutting.</p>	<p>Widening of existing cutting at eastbound and westbound lanes of the A66 Mainline Cutting up to 4m deep for westbound side and 2m deep for eastbound.</p> <p>A66 mainline at approximately 276.2 to 279.0mOD.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Potential for rockhead within cutting.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Rockhead was encountered at shallow depth as distinctly weathered weak MUDSTONE between 285.5mOD to the west and 283.9mOD in the east.	All cutting side slopes to be 1V:3H. Cut off drain at the crest of the northern cutting slope. Where seepages are encountered, localised slope drainage measures may be required.
Earthwork 2 – Cutting/ Embankment	A66 Mainline	51+600 to 51+700	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Glacial deposits described as soft to 2 and 2.6m bgl (276.0mOD).</p> <p>Shallow rockhead encountered as weathered MUDSTONE at 1m and 2.6m bgl (276.0 to 281.0mOD)</p> <p>Rockhead was encountered as medium strong to strong LIMESTONE between 270.8mOD and 272mOD in the vicinity of the underpass.</p> <p>Groundwater was not recorded within any of the nearby holes, however there is potential for shallow groundwater as indicated in the wider area.</p>	<p>Minor cutting of up to 1m across the A66 carriageway Ch. 51+600 and Ch. 51+650.</p> <p>Upfill and embankment required between Ch. 51+650 to Ch. 51+700, with additional localised upfill required about existing access to Blacklodge Farm Underpass. Carriageway levels range from 279 to 276mOD.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>All cutting and embankment side slopes to be 1V:3H.</p> <p>Requirement for site-won or imported Class 1 or Class 2 fill material.</p>
Proposed Pond 3	North of A66 Mainline	51+600	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Rockhead was encountered at shallow depth as distinctly weathered weak MUDSTONE between 281.9mOD to the west and <278.4mOD to the east</p>	<p>Existing ground level varies between 279 and 282mOD. Nearby ground conditions indicate pond may be cut into rock.</p> <p>Partial embankment required. Proposed levels TBC.</p>
Structure 1 – Blacklodge Farm Underpass extension	A66 Mainline	51+700	<p>Made ground associated with the construction of the existing underpass, overlying bedrock.</p> <p>Rockhead comprising medium strong LIMESTONE was proven between 270 and 272mOD (0.6 – 1.2mbgl).</p>	<p>The existing underpass is an in-situ concrete box built partially in embankment. Proposals for extension from 23.4m to 30.0m in length to accommodate A66 widening. The extension is required at its northern end and will comprise a ground bearing reinforced concrete box structure with wingwalls.</p> <p>Potential for rock within excavation, may present hard digging.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
				<p>A new cutting up to 2m deep is required at the underpasses northern access. The cutting is to be 1V:3H and include a crest filter drain.</p> <p>The invert level is at approximately 270mOD.</p>
Section 7.4 Ch. 51+700 to Ch. 52+941 Blacklodge Farm Underpass to end of scheme				
Earthwork 1 – Embankment	A66 Mainline	51+650 to 52+200	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Localised Peat encountered at shallow depth around chainage Ch. 51 +975m, within a historical hole between 0.17 and 0.54mbgl (264.9 – 264.5 mOD).</p> <p>Around chainage Ch 52+000m 2m to 2.6m thick granular glacial deposits described as clayey sandy GRAVEL were encountered interbedded within the cohesive glacial deposits.</p> <p>Rockhead was encountered as medium strong LIMESTONE at 270 to 272mOD along Ch.51+700m, and as weathered weak MUDSTONE at 261.5mOD along Ch. 51+860m. Between Ch 51+860m and 52+200m bedrock was not proven (<260mOD).</p>	<p>A66 widening with eastbound carriageway on new embankment up to 4m in height. Extension to westbound carriageway accommodated by nominal embankment and cutting of up to 1m. Side long ground between 51+700 and 51+900.</p> <p>Potential for compressible peats/ organic materials. Local removal of peat required where appropriate. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>All embankment side slopes to be 1V:3H. Local removal of Peat (if encountered) required.</p> <p>Requirement for site-won or imported Class 1 or Class 2 fill material.</p> <p>Cut-off drain at toe of northern embankment slope.</p>
Proposed Pond 4	South of A66 Mainline	52+050	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Localised Peat encountered at shallow depth around chainage Ch. 51 +975m.</p> <p>Around chainage Ch 52+000m 2m to 2.6m thick granular glacial deposits described as clayey sandy GRAVEL were encountered interbedded within the cohesive glacial deposits.</p> <p>Groundwater encountered within nearby holes at 1.75 to 3.3mbgl (262.6 to 262.0mOD) within glacial deposits.</p> <p>Infiltration testing undertaken nearby indicates permeability c. 5×10^{-5} m/s.</p>	<p>Existing ground level approx. 268mOD.</p> <p>Proposed levels TBC.</p> <p>Local removal of Peat (if encountered) required.</p> <p>Potential for groundwater within excavation.</p> <p>Where soft deposits are encountered at formation level of bunds during excavation they will require over-excavation and replacement with suitable granular material.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
Culvert S07-C07 extension	A66 Mainline	52+165	<p>Made ground associated with road construction overlying glacial deposits over bedrock.</p> <p>Rockhead was not proven by the ground investigation and is anticipated to be <260.8mOD (>4.0mbgl).</p>	<p>Extension to existing culvert proposed under the existing A66 alignment.</p> <p>Invert level: TBC</p> <p>All excavated material should be inspected for evidence of contamination and classified prior to re-use or disposal to a licensed tip.</p>
Earthwork 2 – Nominal cutting/nominal embankment	A66 Mainline	52+200 to 52+941	<p>Topsoil or made ground overlying glacial deposits generally comprising soft to firm, becoming stiff with depth, slightly sandy slightly gravelly CLAY with cobbles.</p> <p>Soft deposits encountered to 1.3m bgl (264.1mOD) at Ch. 52+400. Medium cobble and boulder content noted in this area.</p> <p>Rockhead comprising either medium strong LIMESTONE or weathered weak MUDSTONE between 248.5 and 252mOD.</p> <p>Groundwater encountered at relatively shallow depth within cohesive glacial deposits within a number of holes, with monitored water levels between 0.2 and 2.8mbgl (262.7 to 264.5mOD)</p>	<p>A66 widening with eastbound carriageway in cutting up to 1.5m in depth. Extension to westbound carriageway on nominal embankment of up to 2m.</p> <p>Road level at approximately 263.5 – 266mOD</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>All embankment side slopes to be 1V:3H.</p> <p>Filter drain at crest of northern cutting slope.</p> <p>Potential for shallow groundwater.</p>
Proposed Pond 5	South of A66 Mainline	52+600	<p>Topsoil overlying glacial deposits generally comprising firm slightly sandy slightly gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven within any nearby holes.</p> <p>Nearby historical holes recorded shallow groundwater strikes at c 260mOD.</p>	<p>Existing ground level approx. 260mOD.</p> <p>Proposed levels TBC.</p> <p>Potential for shallow groundwater.</p>
Section 7.5 Ch. 52+200 to Ch. 52+500 Blacklodge Farm Underpass to end of scheme				
Earthwork 1 - Embankment	East Bowes Accommodati on Overpass	52+200 to 52+500	<p>Topsoil overlying glacial deposits generally comprising firm to stiff slightly sandy slightly gravelly CLAY with medium cobble and boulder content.</p> <p>Peaty topsoil encountered at shallow depth around chainage Ch. 52 +380m.</p> <p>Rockhead comprising either medium strong LIMESTONE or weathered weak MUDSTONE between 248.5 and 254.8mOD</p>	<p>New approach embankment for the East Bowes accommodation overpass. Embankment is up to 8.8m high.</p> <p>May require local removal of peat. All embankment side slopes to be 1V:3H.</p> <p>Requirement for site-won or imported Class 1 or Class 2 fill material.</p>

Package D Engineering Assessment Scheme 7: Bowes Bypass				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
Structure 1 – New East Bowes Accommodation Overpass	East Bowes Accommodati on Overpass	52+400	<p>Topsoil overlying glacial deposits generally comprising soft becoming stiff slightly sandy slightly gravelly CLAY with medium cobble and boulder content.</p> <p>Glacial deposits described as soft to firm to 1.3mbgl (265.0mOD) within one hole. Peaty topsoil encountered at shallow depth around Ch. 52+380m.</p> <p>Rockhead comprising medium strong LIMESTONE between 248.5 and 251.1mOD</p> <p>Groundwater encountered at shallow depth within cohesive glacial deposits at 262 to 264mOD.</p>	<p>New overbridge to provide access over widened A66. A new 32m span bridge has been proposed. Approximate overpass level 270mOD, A66 level 265mOD.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Foundations anticipated to comprise shallow foundations on firm to stiff glacial deposits. Piles may be required depending on design loads and capacities.</p> <p>May require local removal of peat.</p>

10.3 Scheme 8: Cross Lanes to Rokeby

- 10.3.1 Scheme 8 covers between chainage Ch. 59+450m and Ch. 63+690m. At the time of writing, two options were being considered for Scheme 8; the black route and the blue route.
- 10.3.2 Each option follows the exiting A66 alignment between chainages Ch. 59+450m and Ch. 63+690m. A new grade separated junction named Cross Lanes Junction is proposed between Ch. 59+600m and Ch. 60+200m. The junction includes a link road to connect Rutherford Lane, Moorhouse Lane and the B6277. The junction includes the construction of new embankments approx 8.6m high and installation of an overbridge.
- 10.3.3 The black route aligns the A66 to the south of its current location between Ch. 60+200 and Ch. 60+500m. It includes a new compact grade separated junction between Ch. 62+100m to Ch. 62+220m, and will comprise the construction of a new underbridge, junction and cuttings. The existing A66 will be de-trunked from the new junction to where it meets Barnard Castle Road. The eastbound merge from Barnard Castle Road onto the A66 will be maintained in its current location.
- 10.3.4 The blue route also aligns the A66 to the south of its current location between Ch. 60+200m and Ch. 60+500m. It includes a new compact grade separated junction between Ch. 62+900m to Ch. 63+050m, and will comprise the construction of a new underbridge, junction and cuttings. The existing A66 will be de-trunked from Ch. 60+200m to the new junction.
- 10.3.5 Reference should be made to HE565627-AMY-HGT-S08-DR-CE-200001-3 in Appendix A. These provide plan and longitudinal sections showing the proposed new road alignment, with the positions of relevant exploratory holes.
- 10.3.6 With reference to CD622 [1] and BS EN 1997-1 [2], the scheme has been assessed as Geotechnical Category 2 with no exceptional geotechnical risks, unusual or difficult ground conditions or loading conditions.
- 10.3.7 Table 10.2 provides the summary of the proposals and ground conditions in Section 8. The proposals provided within the table were based on Design Model Freeze E. It is subject to change dependent on any updates to the design from subsequent model freezes.

Table 10-2: Scheme 8 – Cross Lane to Rokeby – Engineering Assessment

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
Section 8.1 59+450 to 60+300 Start of Scheme and Cross Lanes Junction				
Earthwork 1 – Embankment/at-grade	A66 Mainline	59+450 to 60+300	<p>Thin topsoil or made ground overlying glacial deposits generally comprising firm slightly sandy slightly gravelly CLAY with medium cobble and boulder content.</p> <p>Only historical ground investigation information is available in this area to a maximum depth of 6m.</p> <p>Rockhead was not proven. A borehole to the east of this section indicate rockhead comprising weak MUDSTONE at approx. 185.7mOD.</p>	<p>Widening of existing carriageway. Extension of existing westbound embankment which is up to 2.5m high. Nominal widening of eastbound which is at grade/ in nominal cutting.</p> <p>Approximate road level 204.9mOD to 229mOD.</p> <p>All side slopes are 1V:3H.</p> <p>Cut off drain located at toe of eastbound slopes between Ch. 60+000m to Ch. 60+300m.</p>
Earthwork 2 – Embankment	Cross Lanes Junction	59+600 to 60+200	<p>Thin topsoil or made ground overlying glacial deposits generally comprising firm slightly sandy slightly gravelly CLAY with medium cobble and boulder content.</p> <p>Only historical ground investigation information is available in this area to a maximum depth of 4m.</p> <p>Rockhead was not proven.</p>	<p>New embankment for the Cross Lanes Junction and overbridge. Approximate road level 208.0mOD to 227.5mOD.</p> <p>Embankments up to approximately 8.6m high associated with the Cross Lanes Junction overbridge and approach ramps. Link roads to Rutherford Lane, Moorhouse Lane and B6277 at-grade away from overbridge.</p> <p>All embankment side slopes to be 1V:3H.</p> <p>Requirement for site-won or imported Class 1 or Class 2 fill material.</p> <p>Cut off drains included at toe of several embankments.</p>
New Culverts S08-C01, S08-C02, S08-C03, S08-C04, S08-C05, S08-C06	A66 Mainline and Cross Lanes Junction	59+960 to 60+100	No targeted ground investigation available. Ground conditions anticipated to comprise thin topsoil overlying cohesive glacial materials.	<p>Six new 1.5m diameter culverts are proposed across the Cross Lanes Junction. These vary in length from 18.5m to 148.4m.</p> <p>Ground bearing concrete boxes founded on firm-stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC.</p> <p>Where soft deposits are encountered during excavation they will require over-excavation and replacement with suitable granular material..</p>
Structure 1 – Cross Lanes Overbridge	Cross Lanes Junction	59+930	Thin topsoil or made ground overlying glacial deposits generally comprising firm slightly sandy slightly gravelly CLAY with medium cobble and boulder content.	<p>An overbridge is required at the proposed Cross Lanes Junction. The design of the bridge was in abeyance at the time of writing.</p> <p>Foundations anticipated to comprise shallow foundations on</p>

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Only historical ground investigation information is available in this area to a maximum depth of 4m. Rockhead was not proven.	glacial deposits. Piles may be required depending on design loads and capacities.
Proposed Pond 1	South of A66 Mainline	60+140	No targeted ground investigation available, no nearby historical ground investigation.	Pond 1 to the west of B6277. Rockhead not indicated to be shallow in the general area.
Proposed Pond 2	South of A66 Mainline	60+250	No targeted ground investigation available, no nearby historical ground investigation.	Pond 2 to the south of the A66, to the southwest of the junction between Moorhouse Lane and the proposed link road. Rockhead not indicated to be shallow in the general area.
Section 8.2	60+300 to 62+000	Cross Lanes Junction to Rokeby Junction		
Earthwork 1 – Embankment	Mainline	60+300 to 62+000	Thin topsoil/subsoil or made ground overlying glacial deposits soft becoming stiff slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Granular glacial deposits at depth. Glacial deposits described as very soft to soft up to 2.6m bgl (188.2mOD), typically 2mbgl (variable levels). Localised lenses of granular deposits present. Rockhead comprising weak MUDSTONE at approx. 185.7mOD to the west of this section. Not proven to the east.	Widening of existing alignment and start of re-alignment between Ch. 61+700m to Ch. 62+000m. Embankment up to 3m for westbound A66. At grade/nominal embankment up to 2m for eastbound A66. Localised removal of very soft materials may be required between 60+450 and 60+800. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material. Requirement for site-won or imported Class 1 or Class 2 fill material. All embankment side slopes to be 1V:3H. Cut off drains included at toe of eastbound embankment slope between Ch. 60+300m to Ch. 60+750m.
Culvert S08-C07	Mainline	60+780	Thin topsoil or made ground overlying glacial deposits soft becoming stiff slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Granular Glacial Deposits located at the base of TP CLR008. Glacial deposits described as soft to firm to 1.7m bgl (196.6mOD) within TP CLR008.	Proposed 1.5m diameter culvert under A66 alignment. Approximately 66.4m long. Ground bearing concrete boxes founded on firm - stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
Pond 3	South of A66 Mainline	60+850	Topsoil overlying glacial deposits generally comprising firm slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Granular glacial deposits located at the base of TP CLR009A of SAND and GRAVEL. Rockhead not proven by the ground investigation and is anticipated to be <188.8mOD (>4.5mbgl).	Pond 3 to the south of the A66
Pond 4	South of A66 Mainline	61+230	No targeted ground investigation	Pond 4 to the north of the A66. Rockhead not indicated to be shallow in the general area.
Section 8.3a 62+000 to 63+690 Rokeby Junction and end of Scheme (Black Option Only)				
Earthwork 1 – At-grade/ nominal cutting/ embankment	A66 Mainline	62+000 to 63+690	Thin topsoil overlying glacial deposits generally comprising soft to stiff slightly sandy slightly gravelly CLAY with medium cobble content. Glacial deposits described as soft to firm to 3.2mbgl (163.7mOD) within WS CLR001. Rockhead was not proven.	Realignment of the A66 to the south of its current alignment. New earthworks required for both eastbound and westbound carriageways. At grade and cutting up to 2.5m for westbound carriageway. At grade and nominal embankment and cutting up to 2m for eastbound carriageway. Side long ground between 63+200 and 63+600. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material. All embankment and cutting side slopes to be 1V:3H. Cut off drains included along the crest and toe of eastbound slopes Ch. 62+000m to Ch. 62+900m. Crest of westbound slope between Ch. 62+000m to Ch. 63+100m.
Earthwork 2 – Cutting, at-grade	Rokeby Junction	62+070 to 62+230	No targeted ground investigation. Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	Earthworks associated with the Rokeby Junction. Cutting up to approximately 6m deep associated with the Rokeby Junction underbridge. Crest filter drain at crest of cutting. Where seepages are encountered localised slope drainage measures may be required. All cutting side slopes to be 1V:3H.
New Culverts S08-C08, S08-C09, S08-C010	A66 Mainline and Rokeby Junction	62+090 to 62+180	No targeted ground investigation.	Three new 1.5m diameter culverts at Rokeby Junction.

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	Ground bearing concrete boxes founded on firm- stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC.
Structure 1 – Rokeby Junction Underbridge	Rokeby Junction	62+120	No targeted ground investigation. Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	New underbridge at Rokeby Junction. The design of the bridge was in abeyance at the time of writing. Foundations anticipated to comprise shallow foundations on glacial deposits. Piles may be required depending on design loads and capacities.
Proposed Pond 5	South of A66 Mainline	62+500	No targeted ground investigation. Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	Pond 5 to the south of the proposed A66 alignment
Proposed Pond 6	South of A66 Mainline	63+200	No targeted ground investigation. Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	Pond 6 to the south of the A66
New Culvert S08-C11	A66 Mainline	62+540	Thin topsoil overlying glacial deposits generally comprising soft to stiff slightly sandy slightly gravelly CLAY with cobbles noted. Rockhead was not proven.	Proposed 1.5m diameter culvert under proposed A66 realignment. Approximately 60.7m long. Ground bearing concrete boxes founded on firm -stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC
New Culvert S08-C12	A66 Mainline	62+900	No ground investigation information available in the area. Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits. Rockhead was not proven.	Proposed 1.5m diameter culvert under proposed A66 realignment. Approximately 38m long. Ground bearing concrete boxes founded on firm-stiff glacial deposits are currently proposed to form the culverts. Invert levels TBC
Culvert S08-C13 extension	A66 Mainline	63+100	Thin topsoil overlying glacial deposits generally comprising soft to firm slightly sandy slightly gravelly CLAY with medium cobble content. Rockhead was not proven	Information about the existing culvert unknown at the time of writing. Assumed to have a small diameter. Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.
Section 8.3b 62+000 to 63+690 Rokeby Junction and end of Scheme (Blue Option Only)				
Earthwork 1 – At-grade/ nominal cutting/ embankment	A66 Mainline	62+000 to 63+690	Thin topsoil overlying glacial deposits generally comprising soft to stiff slightly sandy slightly	Realignment of the A66 to the south of its current alignment. New earthworks required for whole carriageway.

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
			<p>gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven.</p>	<p>At grade and cutting up to 2.5m for westbound carriageway. At grade and nominal embankment and cutting up to 2m for eastbound carriageway. Side long ground between 63+200 to 63+600.</p> <p>Proposed road level 138 – 183mOD</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material</p> <p>All embankment and cutting side slopes to be 1V:3H.</p> <p>Cut off drains included along the crest and toe of eastbound slopes Ch. 60+000 to Ch. 62+900.</p>
New Culvert S08-C08	A66 Mainline	62+180	<p>No ground investigation information available in the area.</p> <p>Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits.</p> <p>Rockhead was not proven.</p>	<p>Proposed 1.5m diameter culvert under proposed A66 realignment. Approximately 57.1m long.</p> <p>Approximate road level 191.8mOD</p> <p>Ground bearing concrete boxes founded on firm-stiff glacial deposits are currently proposed to form the culverts.</p> <p>Invert levels TBC</p>
Proposed Pond 5	South of A66 Mainline	62+500	<p>No targeted ground investigation.</p> <p>Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits.</p> <p>Rockhead was not proven.</p>	<p>Pond 5 to the south of the A66 .</p>
New Culvert S08-C09	A66 Mainline	62+550	<p>No ground investigation information available in the area.</p> <p>Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits.</p> <p>Rockhead was not proven.</p>	<p>Proposed 1.5m diameter culvert under proposed A66 realignment. Approximately 60.7m long.</p> <p>Ground bearing concrete boxes founded on firm-stiff glacial deposits are currently proposed to form the culverts.</p> <p>Invert level TBC</p>
Earthwork 2 – Cuttings	Rokeby Junction	62+880 to 63+050	<p>Thin topsoil overlying glacial deposits generally comprising soft to firm slightly sandy slightly gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven but it is anticipated to be below proposed road level. .</p>	<p>Earthworks associated with the Rokeby Junction. Cutting up to approximately 6m deep associated with the Rokeby Junction underbridge.</p> <p>Where soft deposits are encountered at formation level during excavation they will require</p>

Package D Engineering Assessment Scheme 8: Cross Lanes to Rokeby				
Feature	Location	Chainage (m)	Stratigraphy	Proposal
				<p>over-excavation and replacement with suitable granular material.</p> <p>All cutting side slopes to be 1V:3H.</p> <p>Cut off drains included along the crest of southern access roads. Where seepages are encountered, localised slope drainage measures may be required.</p>
New Culverts S08-C10, S08-C11, S08-C012	A66 Mainline and Rokeby Junction	62+880 to 63+050	<p>Thin topsoil overlying glacial deposits generally comprising soft to firm slightly sandy slightly gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven</p>	<p>Three new 1.5m diameter culverts at the Rokeby Junction.</p> <p>Ground bearing concrete boxes founded on firm glacial deposits are currently proposed to form the culverts. Invert levels TBC</p>
Structure 1 – Rokeby Junction Underbridge	Rokeby Junction	63+050 to 63+050	<p>Thin topsoil overlying glacial deposits generally comprising firm to stiff slightly sandy slightly gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven by the ground investigation and is anticipated to be <150.mOD (>6.8mbgl).</p>	<p>New underbridge at Rokeby Junction. The design of the bridge was in abeyance at the time of writing.</p> <p>Foundations anticipated to comprise shallow foundations on glacial deposits. Piles may be required depending on design loads and capacities.</p>
Culvert S08-C13 extension	A66 Mainline	63+100	<p>Thin topsoil overlying glacial deposits generally comprising soft to firm slightly sandy slightly gravelly CLAY with medium cobble content.</p> <p>Rockhead was not proven (<155mOD)</p>	<p>Information about the existing culvert unknown at the time of writing. Assumed to have a small diameter.</p> <p>Where soft deposits are encountered at formation level during excavation they will require over-excavation and replacement with suitable granular material.</p> <p>Approximate road level 156.1mOD.</p>
Proposed Pond 6	North west of the C165 Barnard Castle Road	63+200	<p>No targeted ground investigation.</p> <p>Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits.</p> <p>Rockhead was not proven.</p>	Pond 6 to the north west of the C165 Barnard Castle Road
Proposed Pond 7	South of A66 Mainline	63+200	<p>No targeted ground investigation.</p> <p>Anticipated ground conditions comprise thin topsoil overlying Cohesive Glacial Deposits.</p> <p>Rockhead was not proven.</p>	Pond 7 to the south of the A66

10.4 Material Classification

- 10.4.1 Material properties are presented in detail within chapters 4 and 6 of this report. The appraisal presented here discusses the types of materials with respect to overall proportionate quantities, probable percentages acceptable for general earthworks, pavement subgrades and slope stability. Considerations for potential ground improvement are presented within sub-heading 10.6.
- 10.4.2 Topsoil was encountered across Scheme 7, and is on average 290mm thick, and locally up to 500mm thick. In addition, some locations encountered glacial deposits beneath Topsoil with a description consistent with topsoil or cultivated material to a maximum depth of 0.7m bgl.
- 10.4.3 Topsoil is present in the majority of offroute proposals for Scheme 8, and is on average 310mm thick, but locally up to 600mm thick. In some areas of cultivated fields, glacial deposits beneath topsoil were consistent with topsoil or cultivated material to a depth of 1.1m bgl.
- 10.4.4 Glacial deposits predominantly comprise cohesive materials, with localised areas of higher proportions of granular materials encountered between Ch. 50+500 and 50+750 and 60+300 to 60+475 in the central areas of both Scheme 7 and Scheme 8. The granular deposits appear as sheets and lenses of varying lateral and vertical extents within the clay matrix.
- 10.4.5 Based upon the total strata thicknesses encountered during the 2021 and historical ground investigations, an estimate of the proportion of materials has been established. Within the Scheme 7 area approximately 10% of materials are indicated to be granular, with 6% within Scheme 8.
- 10.4.6 The relationship between natural moisture content and plastic limit is a determinant of re-usability of excavated fine soil in its natural or 'as dug' condition. The SHW uses this relationship to classify suitability as fill and generally allows a range of moisture contents around the plastic limit. The upper limit of moisture content for Class 2B (dry cohesive fill) is set at PL-4%. The majority of samples of cohesive glacial deposits are shown to be unsuitable as Class 2B. Further assessment is required to determine the proportion of materials that would classify as Class 2A/2C (wet cohesive fill/stony fill), as in their current state they are generally too wet. The potential for improving the engineering properties of excavated clays using lime/cement binders is discussed under sub-heading 10.6.

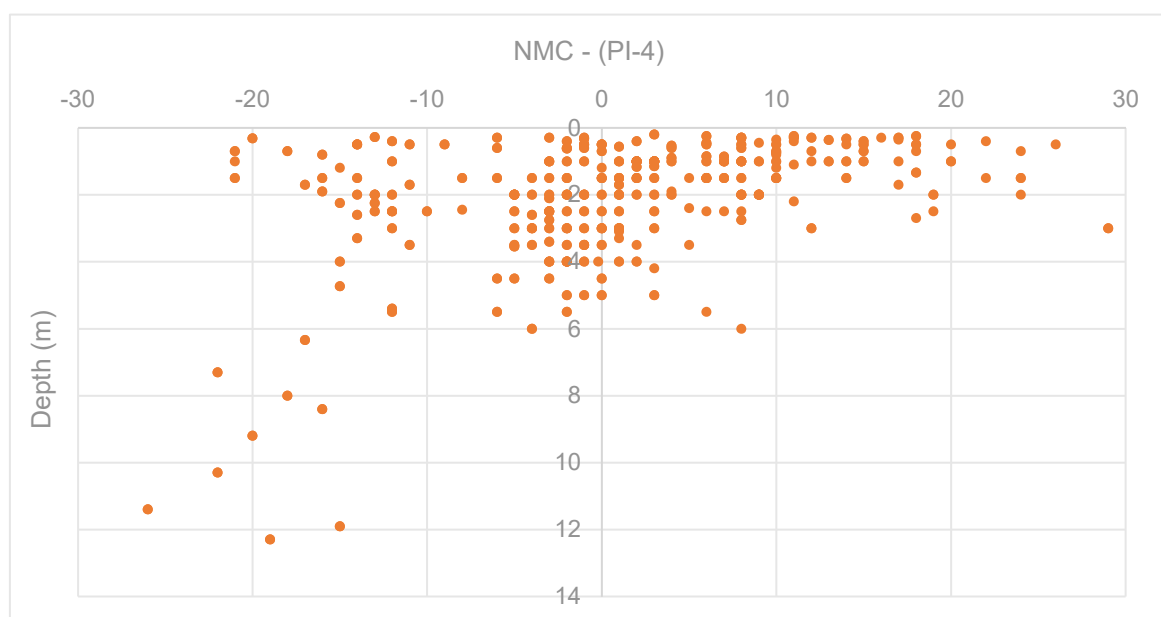


Figure 5 Scheme 7 NMC - (PI-4)

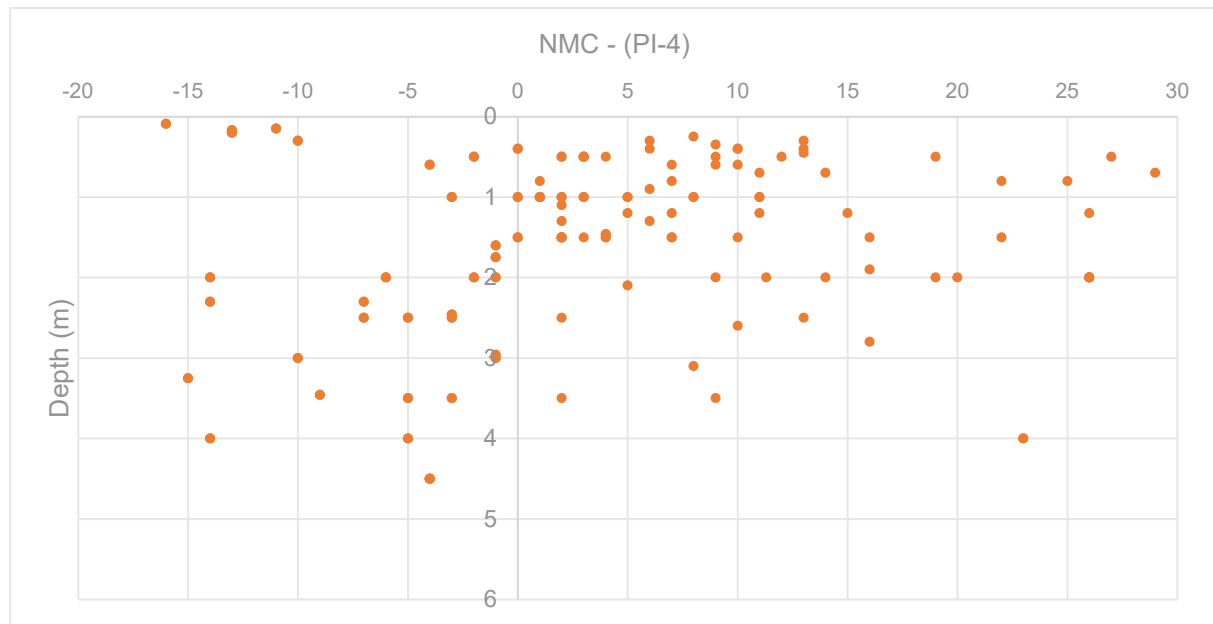


Figure 6 Scheme 8 NMC - (PI-4)

10.5 Subgrade Preliminary Assessment

- 10.5.1 The road pavement must reduce the stresses on the subgrade due to traffic loads to a level that ensures that there is only very limited deformation at the end of the design life. Both stiffness and strength of the subgrade play a part in determining its performance. The road is expected to require a Pavement Foundation Class of 3 as defined in CD 225 Design for New Pavement Foundations [65]. This requires a foundation modulus of 200Mpa and minimum Subgrade Surface Modulus (SSM) of 30MPa. Failure to establish the minimum value of SSM will require either excavation and replacement up to 1.0m or subgrade improvement. Although a minimum undrained shear strength of 40kPa is often cited as the lowest permissible value compatible with the trafficking and handling of cohesive materials a value of 50kPa is often applied to ensure variabilities during site works are safely accommodated.
- 10.5.2 A SSM of 30MPa is equivalent to a CBR of approximately 2.5% based on equation 2.4 of CD225 [65]. The median recorded laboratory CBR within cohesive deposits was 1.1% in scheme 7 and 1.7% in Scheme 8. In-situ CBR tests recorded median values of 2.0% and 1.35% for schemes 7 and 8 respectively. Long term CBRs of 4% and 5% are, however, derived based on PI for average construction methods with high water table. Undrained shear strengths less than 50kPa are anticipated within the top 2-3m within schemes 7 and 8.
- 10.5.3 It may be possible to improve subgrade parameters by compaction (heavy proof rolling) following topsoil strip and excavation to a sub-formation level providing the excess moisture can be extracted (bled to surface) and removed (drained) during compaction. Alternatively the material may require improvement with lime/ cement or be classified as unacceptable.
- 10.5.4 Further CBR testing should be undertaken during the next phase of ground investigation to further investigate the requirements for subgrade improvement.
- 10.5.5 Although the moisture condition value (MCV) is not a definitive primary parameter, it is frequently used to manage acceptability on site and if MCV values are to be employed to assess acceptability further work is required to develop the moisture content/mcv relationship in association with MDD/OMC to establish limits equating to 95% compaction.
- 10.5.6 No presence of Class U1B or U2 materials has been indicated. The presence of coal tar products in the existing carriageway needs to be investigated during the detailed ground investigation to define appropriate measures or additional health and safety controls required.

10.6 Potential for Ground Improvement

- 10.6.1 MCV tests undertaken at a range of moisture contents show average MCV value of 6.8% (scheme 7) and 8.1% (scheme 8). The optimum moisture content (OMC) of 11.5% and 10.5% derived from compaction tests corresponds to an MCV of 12% (scheme 7) or 11% (scheme 8). It is noted that there is significant variability in the MCV test results at any given moisture content, and a limited number of MCV tests were undertaken at moisture content below 12% as the material was generally found to be too wet of optimum. As a result, it is anticipated that the material will be too wet to place immediately after excavation and consideration should be given to treating the soil with lime and/or other binders to improve its properties and allow placement to take place.
- 10.6.2 The improvement of engineering properties of clay fills through the addition of a small percentage of lime binder has been a popular ground improvement technique in the UK since the 1970's. However, it is well documented that lime treatment of sulphate bearing soils has potential to generate problems for construction due to adverse soil chemistry.
- 10.6.3 The withdrawn HA 74/07 [61] recommends the limits for acceptability of sulphide and sulphate content is determined on a site by site basis, by testing appropriate samples and relating the swelling measured on soaked CBR tests to the sulphate and sulphide content. It also recommends that the upper limit value of Total Potential Sulphate (TPS) should not exceed 1.0% and warns that there is evidence that, for some materials, values as low as 0.25% may cause swelling. These recommendations are still considered valid, and have been taken forward on the Britpave publications.
- 10.6.4 The Britpave publication on lime stabilisation [62] advises caution is exercised where TPS is greater than 1.0% as this has the potential to cause adverse effects such as swelling where stabilisation is required; however, it states that for treatment rather than stabilisation, the acceptable TPS may be higher.
- 10.6.5 Testing for organic matter in tandem with testing for sulphates and sulphides is also recommended as this may interfere with the normal reaction between the lime and the soil. An upper limit of 2% organic content for acceptability of the untreated material is a useful guide, although there is some evidence to suggest that it is the type rather than the amount of organic matter which affects stabilisation.
- 10.6.6 The principal material on package D that may be subject to ground treatment is the Cohesive Glacial Deposits. A review of sulphate testing across both schemes has identified a proportion of these materials are likely to record TPS values in excess of 1%, although shallower samples (<4m bgl) tend to record values lower than 1%. Figure 7 shows TPS against chainage for each sample tested along scheme 7, and Figure 8 shows TPS against chainage along scheme 8. Figures 6 and 8 show the same results vs depth rather than chainage for scheme 7 and 8 respectively.
- 10.6.7 Further ground investigation and laboratory testing is recommended to assess the variation of TPS against depth and chainage of excavated materials.
- 10.6.8 Consideration should also be given to undertaking an early compaction trial to demonstrate the acceptability of the excavated materials at higher than optimum moisture content.

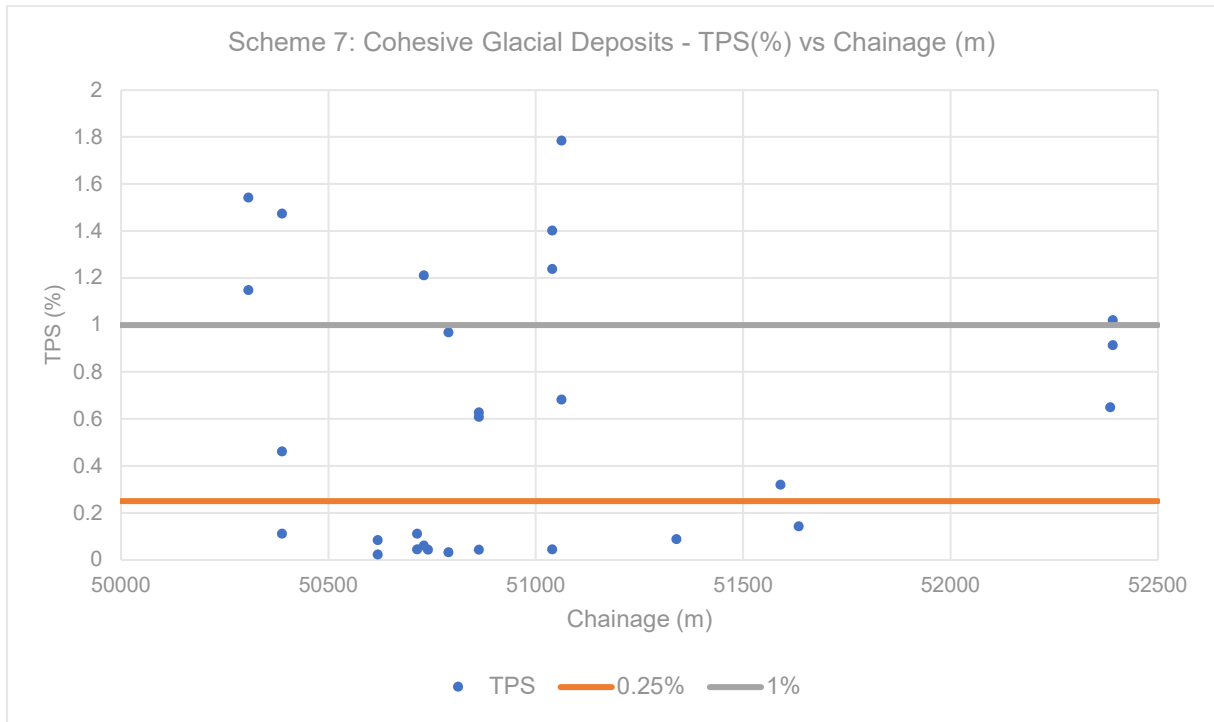


Figure 7: Cohesive Glacial Deposits total potential sulphates vs chainage for Scheme 7

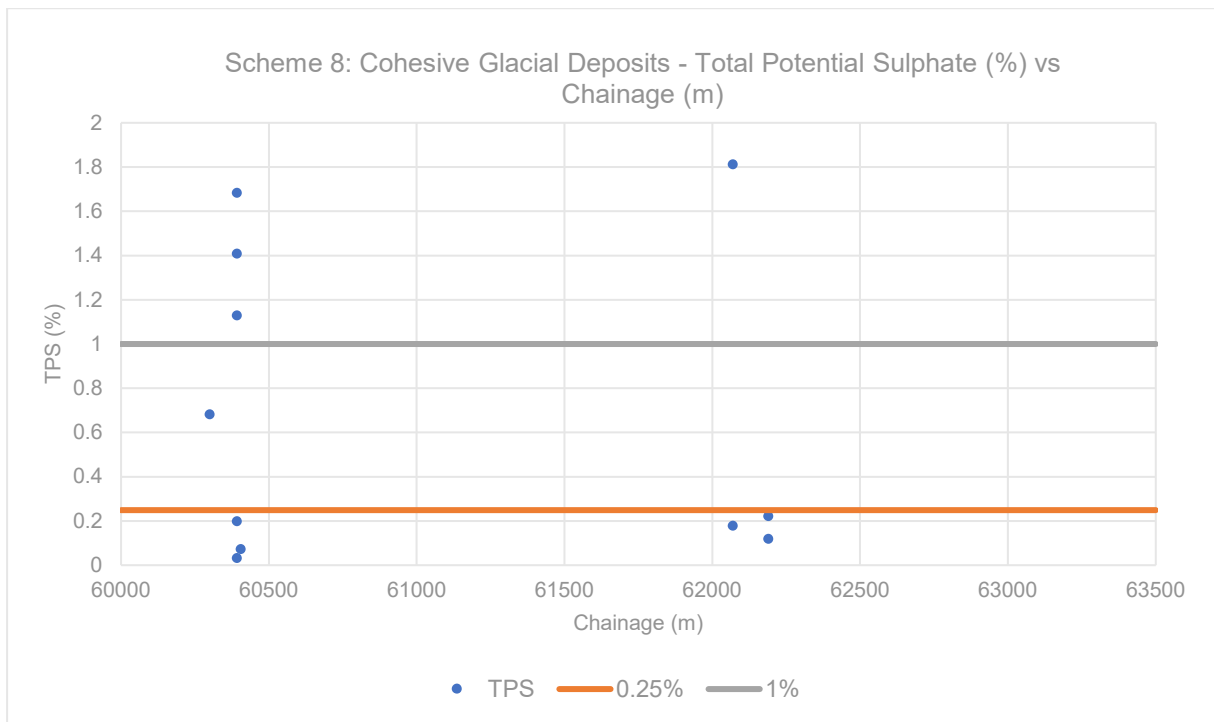


Figure 8: Cohesive Glacial Deposits total potential sulphate vs chainage for Scheme 8

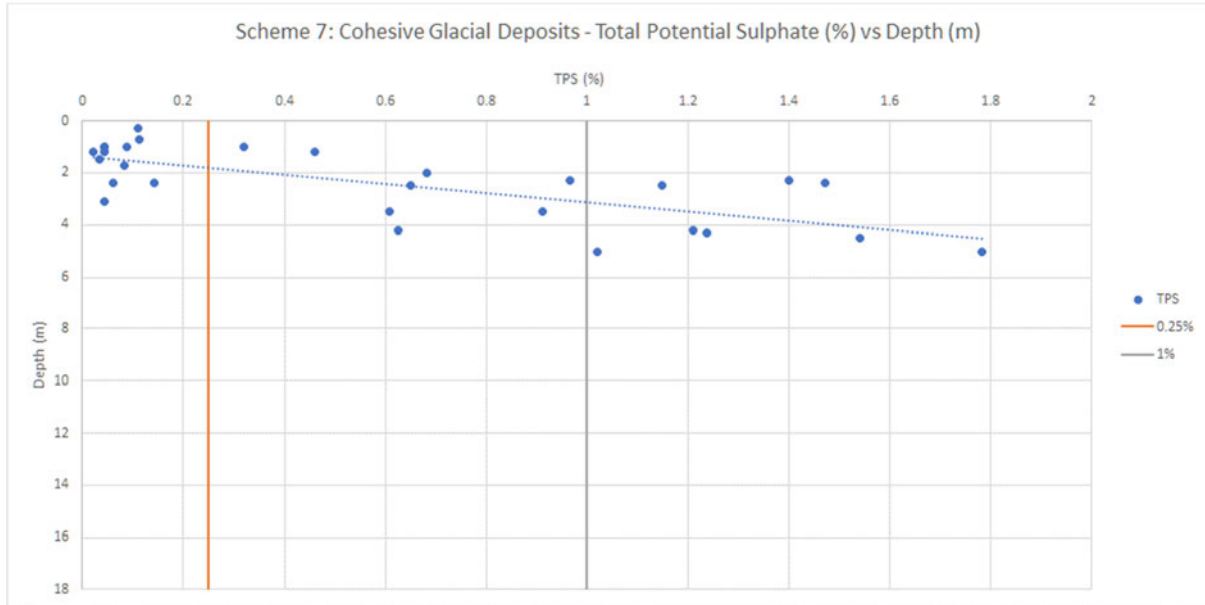


Figure 9: Cohesive Glacial Deposits total potential sulphate vs depth for Scheme 7

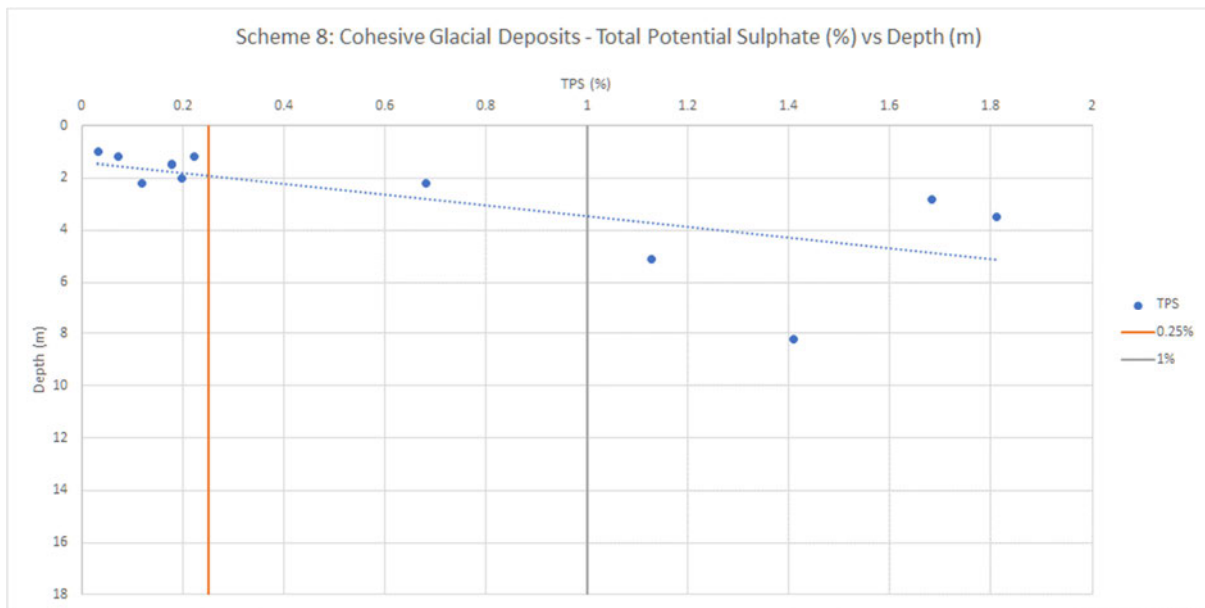


Figure 10: Cohesive Glacial Deposits total potential sulphate vs depth for Scheme 8

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A Drawings

A.1 Scheme 7



RESIDUAL DESIGN HAZARDS
 (The following information has been collected from Preconstruction Information and the Amey Arup DJV CDM Hazard Management Process.)

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- KEY**
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 - Existing watercourse
 - Proposed layout
 - Highway structure
 - Culvert
 - Cut-off drain
 - Filter Drain
 - Proposed boundary treatment
 - Proposed gate
 - Traffic sign
 - Proposed lighting column
 - Proposed vehicle restraint system
 - Headwall
 - Pipe to Outfall
 - Earthworks
 - Pond
 - Proposed Bridleway
 - Abandoned Bridleway
 - Existing Bridleway
 - Proposed Footway/Footpath
 - Abandoned Footway/Footpath
 - Existing Footway/Footpath
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 - Existing Shared Cycle Footway
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 - ACNB
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 - HISTORICAL TRIAL PITS
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 - HISTORICAL ROTARY CORE HOLES
 - BH - BOREHOLE
 - TP - TRIAL PIT
 - WS - WINDOW SAMPLE
 - HDP - HAND DUG PIT
 - SW - SURFACE WATER SAMPLE

Revision	Created	Checked	Reviewed	Approved	Authorised
P012					

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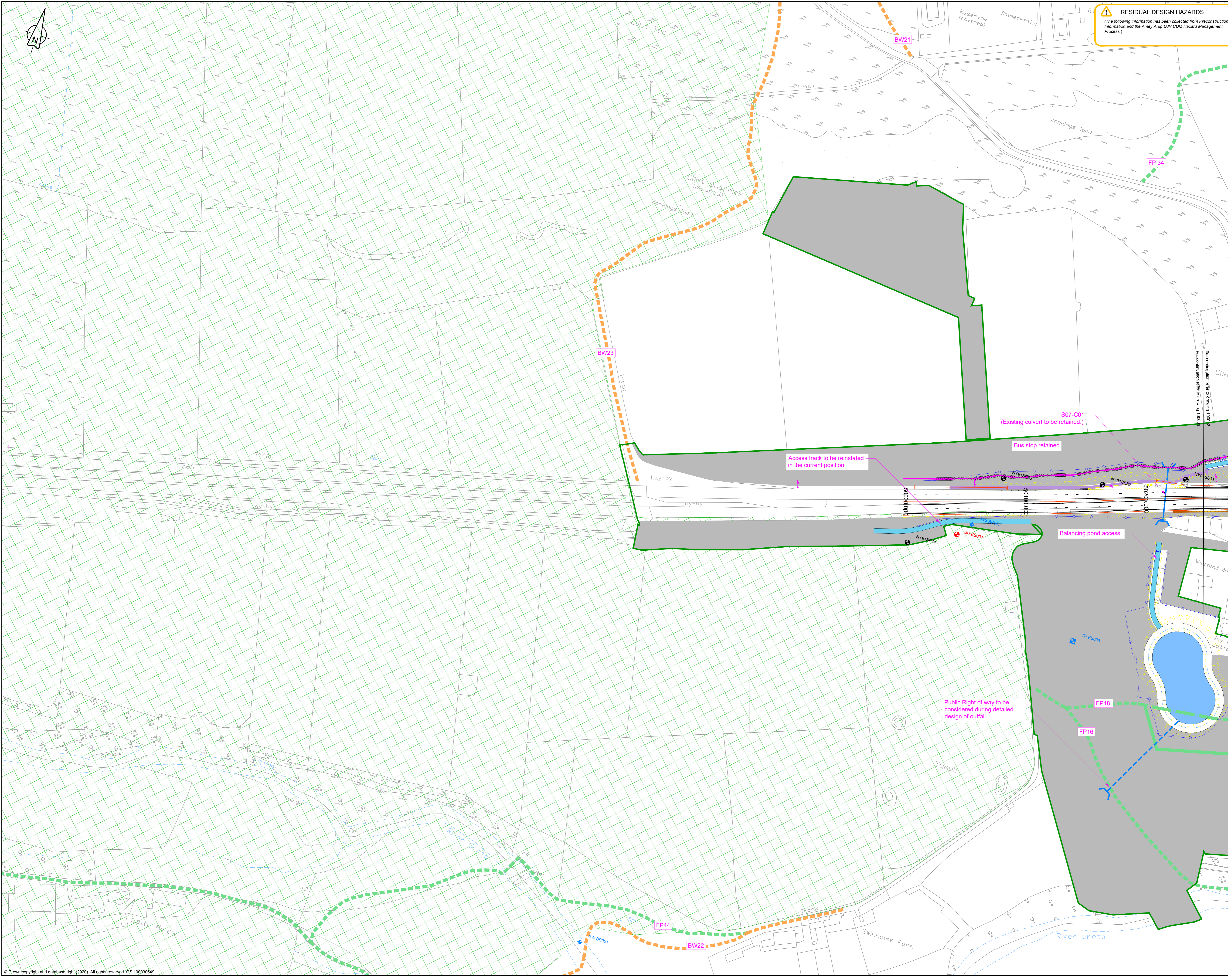
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A66 Northern Trans-Pennine

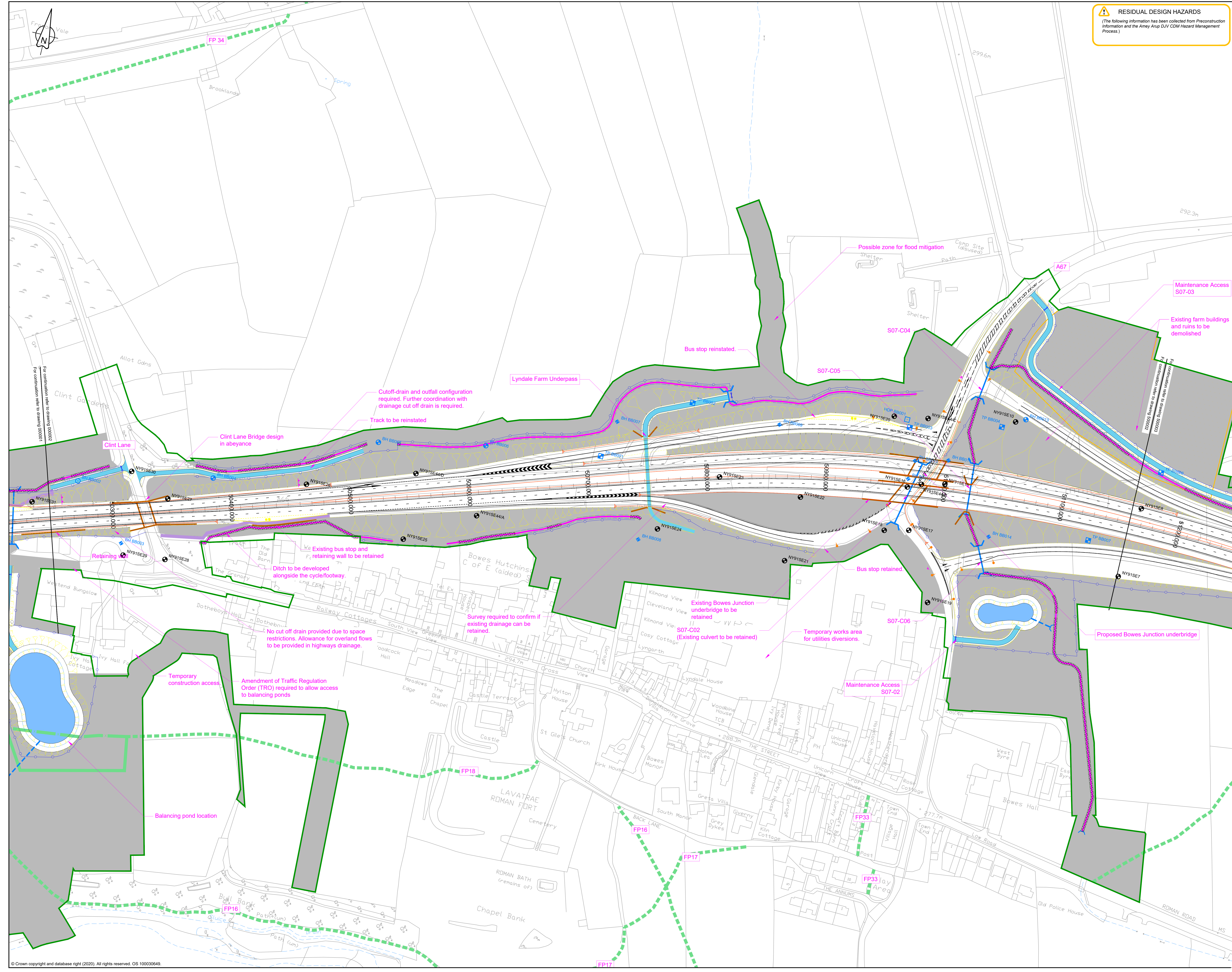
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**Scheme 7: Bowes Bypass
 As Built Exploratory Hole Plan
 Sheet 1 of 5**

Project Ref. No.	Stage	Scale: 1:1000	@ A0

Drawing Number
 Project | Originator | Volume | Number
HE565627 - AMY - HGT - S07 - DR - CE - 100001

Suitability | Suitability Description | Revision
S4 | Initial non-contractual code | P02





RESIDUAL DESIGN HAZARDS
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 - Headwall
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 - Earthworks
 - Pond
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 - Abandoned Brideway
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 - Existing Footway/Footpath
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Revision	Created	Checked	Reviewed	Approved	Authorised
P01	JBEL	MSAL	MSAL	MSAL	---
	07/03/22	08/03/22	08/03/22	08/03/22	---

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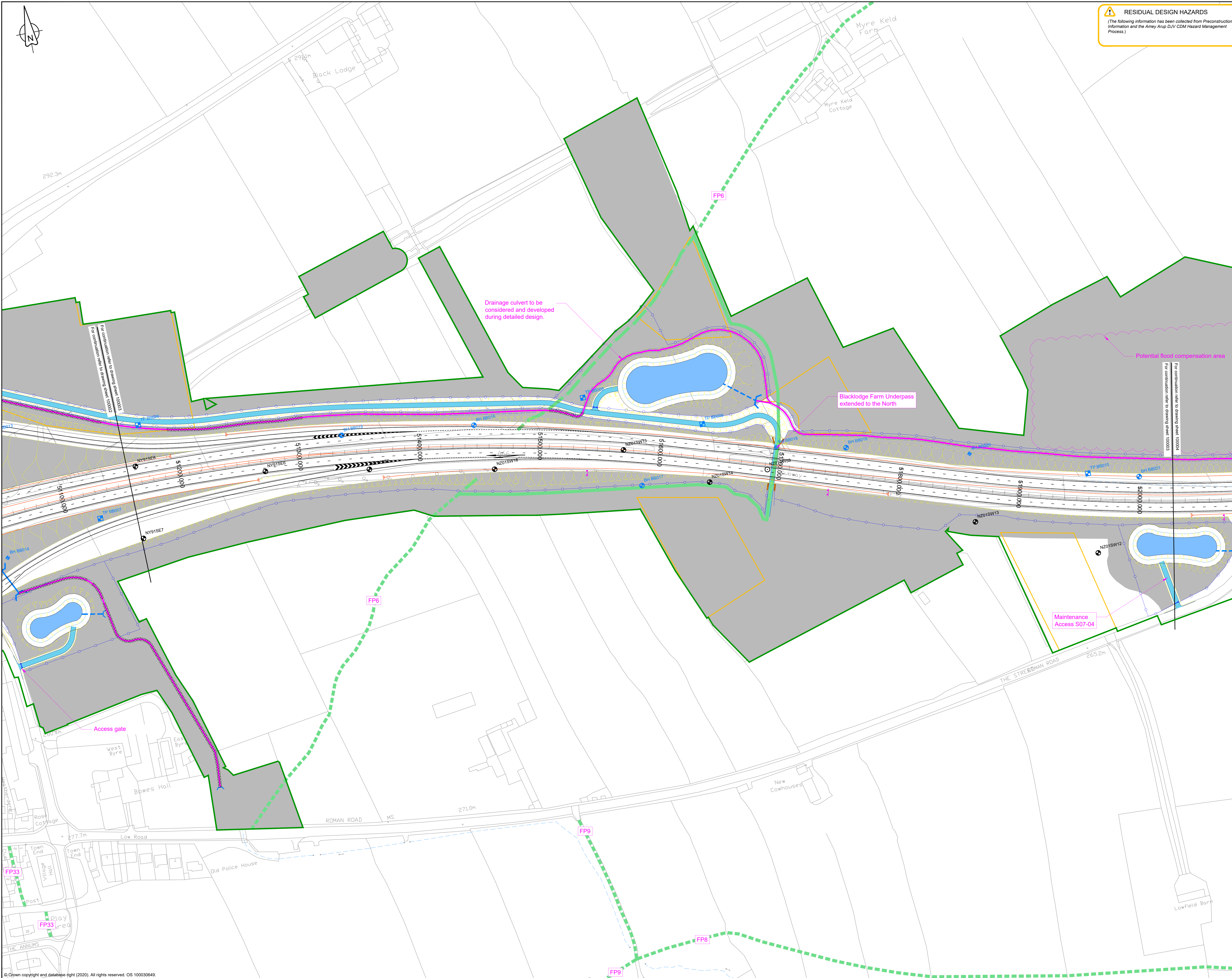
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Drawing Title
**Scheme 7: Boves Bypass
 As Built Exploratory Hole Plan
 Sheet 2 of 5**

Project Ref No.	Stage	Scale	@ AD
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Drawing Number	Project	Originator	Volume
HE565627 - AMY - HGT -	S07	-DR-CE - 100002	---
	Location	Type	Role
			Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01



RESIDUAL DESIGN HAZARDS
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Revision	Created	Checked	Reviewed	Approved	Authorised
	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

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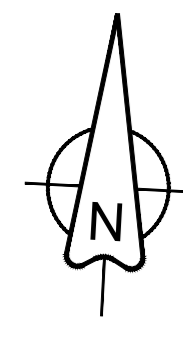
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 7: Bowes Bypass
 As Built Exploratory Hole Plan
 Sheet 3 of 5**

Project Ref. No.	Stage	Scale: 1:1000	@ A0

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S07 -DR-CE - 100003
 Location | Type | Role | Number

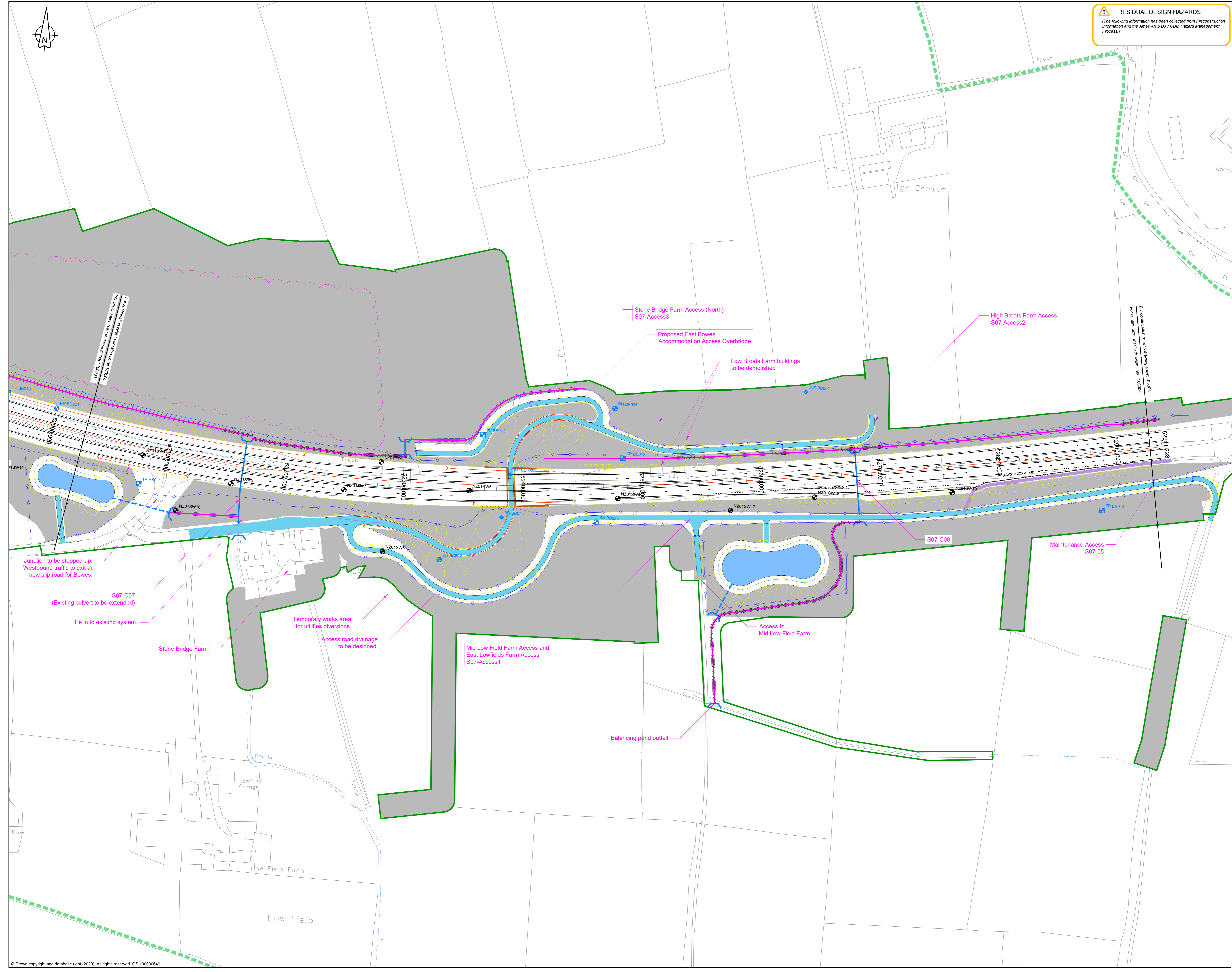
Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01



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Revision	Created	Checked	Reviewed	Approved	Authorised
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highways england

Project Name
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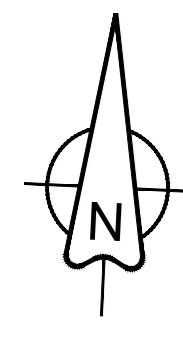
Drawing Title
**Scheme 7: Bowes Bypass
 As Built Exploratory Hole Plan
 Sheet 4 of 5**

Project Ref. No.	Stage	Scale : 1:1000	@ A0

Dimensions : M

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S07 -DR-CE - 100004
 Location | Type | Role | Number

Suitability | Suitability Description | Revision
S4 | Fit for Stage Approval | **P01**



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 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - 2021 WINDOWLESS SAMPLES
 - 2021 ROTARY CORE HOLES
 - HISTORICAL ROTARY CORE HOLES
 - BH - BOREHOLE
 - TP - TRIAL PIT
 - WS - WINDOW SAMPLE
 - HDP - HAND DUG PIT
 - SW - SURFACE WATER SAMPLE

Revision details					
Revision	Created	Checked	Reviewed	Approved	Authorised
	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy
P01	JBEL	MSAL	MSAL	MSAL	---
	07/03/22	08/03/22	08/03/22	08/03/22	---

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A66 NTP Integrated Project Team

Client
highways england
 3 Piccadilly Place
 Manchester
 M1 3BN

Project Name
A66 Northern Trans-Pennine

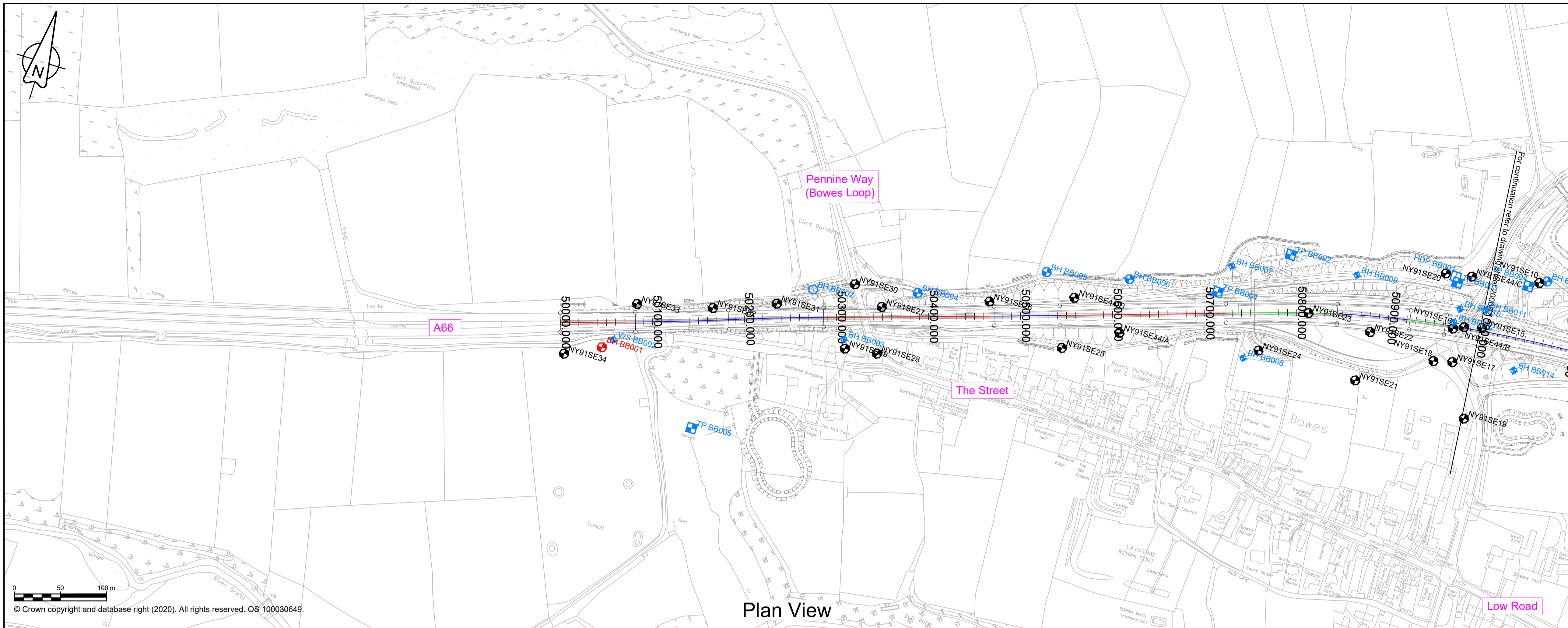
Drawing Title
**Scheme 7: Bowes Bypass
 As Built Exploratory Hole Plan
 Sheet 5 of 5**

Project Ref. No.	Stage	Scale : 1:1000	@ A0
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Drawing Number			
Project	Originator	Volume	
HE565627 - AMY - HGT -			
S07	-DR-CE-	100005	
Location	Type	Role	Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01



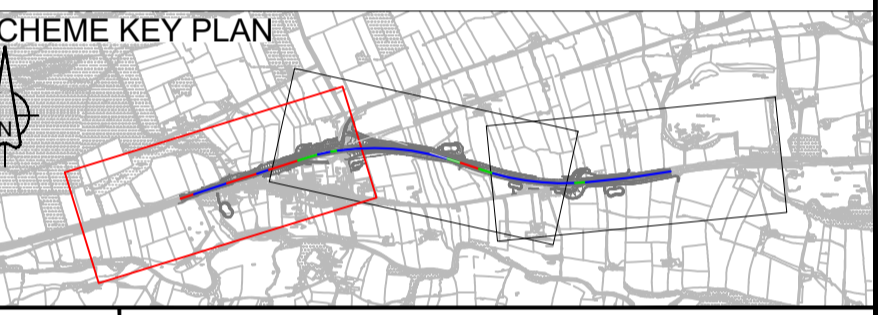


NOTES

- ALL DIMENSIONS ARE IN METRES ABOVE DATUM UNLESS NOTED OTHERWISE.
- THE DESIGN SHOWN ON THESE ENGINEERING SECTION DRAWINGS IS ILLUSTRATIVE AND WILL BE SUBJECT TO DETAILED DESIGN DEVELOPMENT.
- LAYOUT SHOWN IS DESIGN FREEZE D.

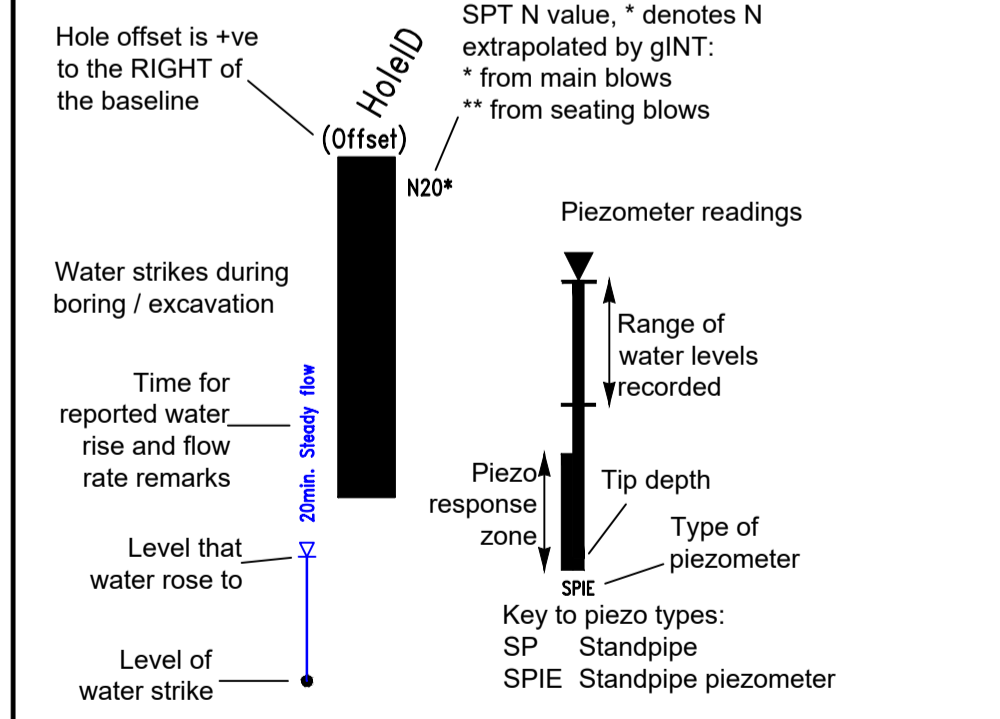
KEY
Plan

- THE SCHEME (SHOWN FOR ILLUSTRATIVE PURPOSES ONLY)
 - ROAD NAMES
 - CHAINAGE (MEASURED DISTANCE ALONG THE SCHEME LENGTH)
 - 2021 CABLE PERCUSSIVE HOLES
 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
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WS - WINDOW SAMPLE
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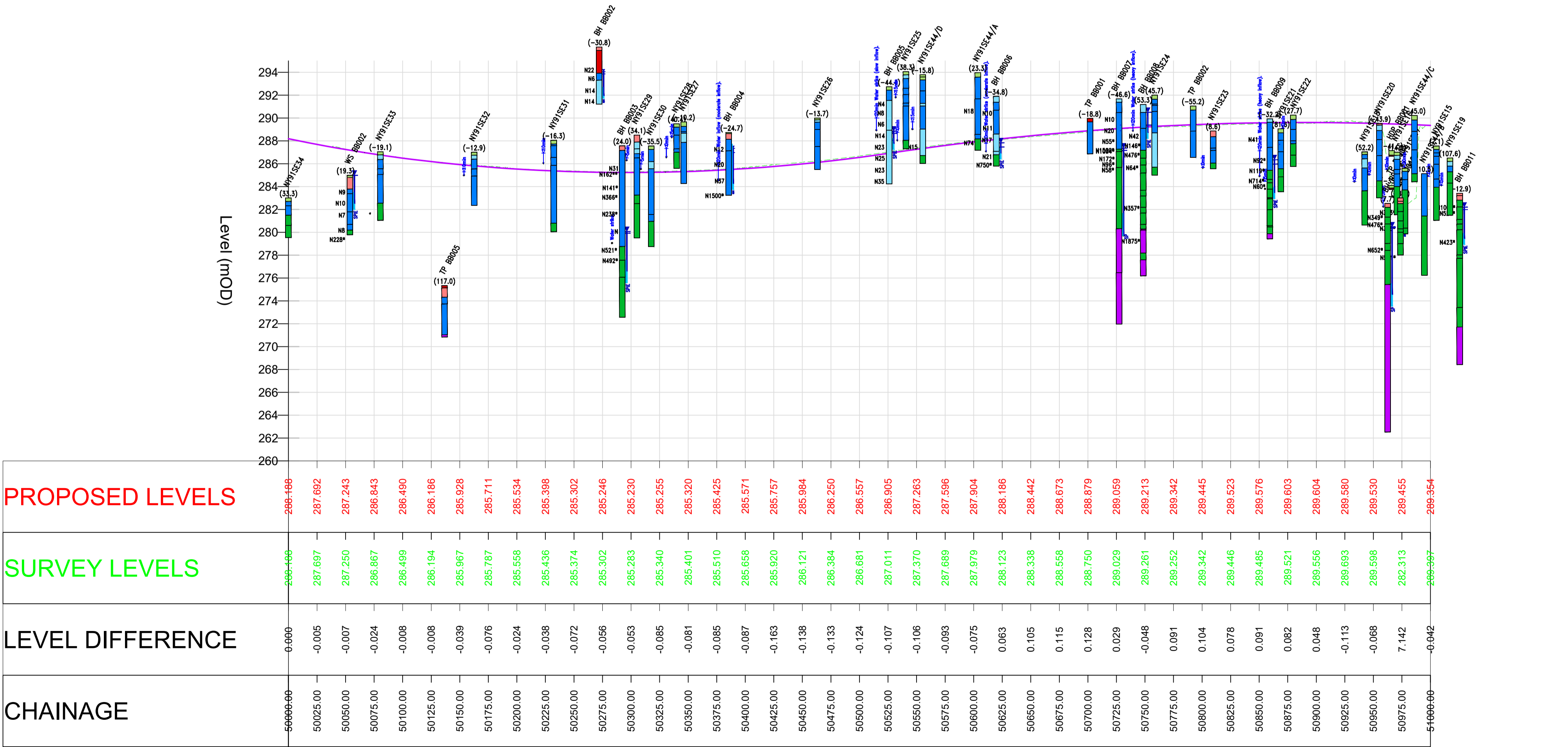
KEY
Profile

- PROPOSED VERTICAL DESIGN LEVEL
- EXISTING GROUND LEVEL
- TOPSOIL
- MADE GROUND - COHESIVE
- MADE GROUND - GRANULAR
- GLACIAL DEPOSITS - COHESIVE
- GLACIAL DEPOSITS - GRANULAR
- PEAT
- MUDSTONE
- LIMESTONE
- SANDSTONE



Profile View

Scale H 1:2500; V 1:250



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P01	SBRO	MSAL	MSAL	MSAL	---
	17/01/22	17/01/22	08/03/22	08/03/22	---
Revision	Revision details				
	Created	Checked	Reviewed	Approved	Authorised
	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

Designer
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10 Furnival Street
London, EC4A 1AB

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3 Piccadilly Place
Manchester
M1 3BN

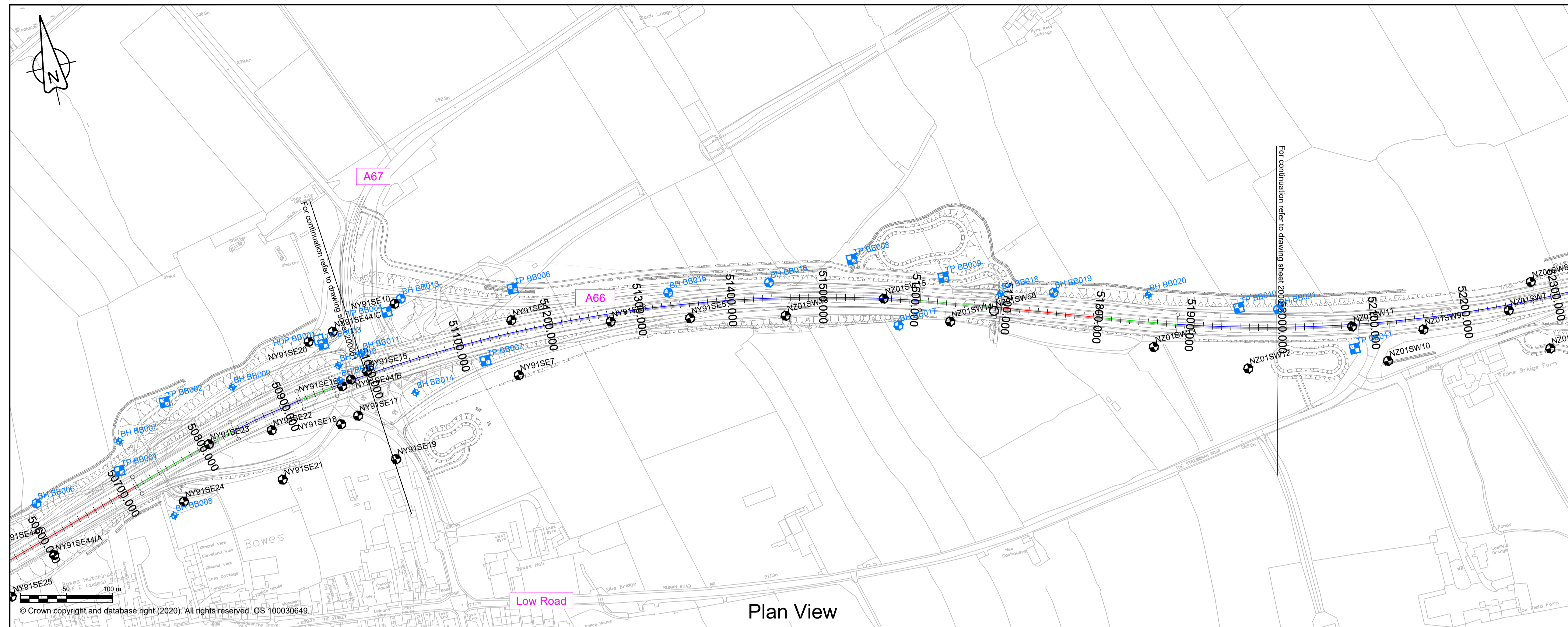
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Bowes Bypass
Geological Long Section
Sheet 1 of 3**

Project Ref. No.	Stage	Scale	@ A1
---	PCF3	1:2500	
		Dimensions	M

Drawing Number
Project | Originator | Volume |
HE565627 - AMY - HGT -
S07 -DR-CE-20001
Location | Type | Role | Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01



NOTES

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- LAYOUT SHOWN IS DESIGN FREEZE D.

KEY

Plan

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- HISTORICAL TRIAL PITS
- 2021 WINDOWLESS SAMPLES
- 2021 ROTARY CORE HOLES
- HISTORICAL ROTARY CORE HOLES

BH - BOREHOLE
 TP - TRIAL PIT
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 SW - SURFACE WATER SAMPLE

For continuation refer to drawing sheet 200000.0000

KEY Profile

- PROPOSED VERTICAL DESIGN LEVEL
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- MADE GROUND - GRANULAR
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- GLACIAL DEPOSITS - GRANULAR
- PEAT
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- LIMESTONE
- SANDSTONE

Hole offset is +ve to the RIGHT of the baseline

SPT N value, * denotes N extrapolated by gINT:
 * from main blows
 ** from seating blows

Piezometer readings

Water strikes during boring / excavation

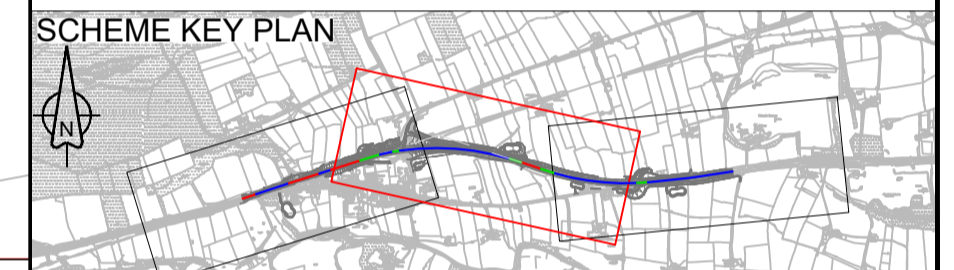
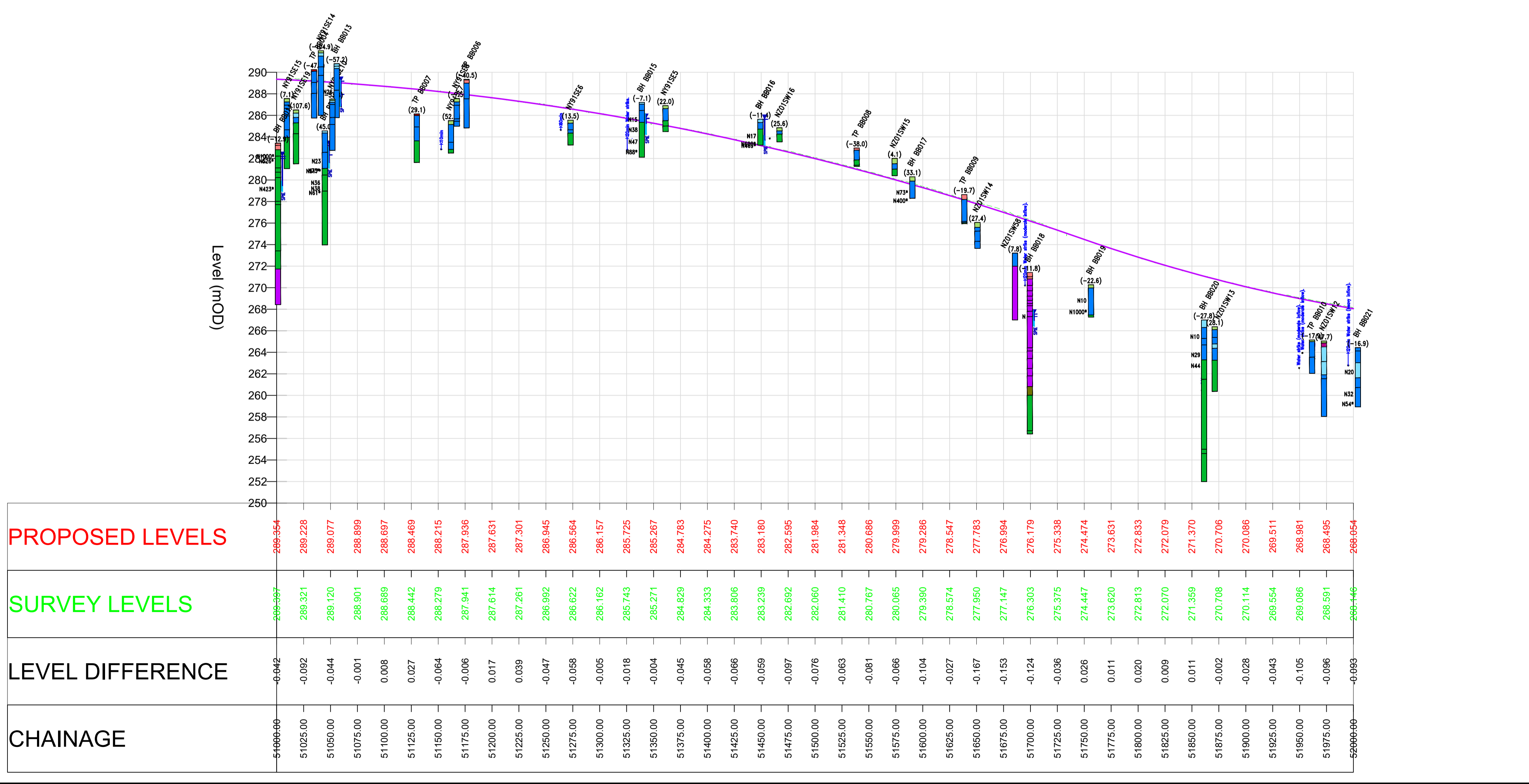
Time for reported water rise and flow rate remarks

Level that water rose to

Level of water strike

Key to piezo types:
 SP Standpipe
 SPIE Standpipe piezometer

Scale H 1:2500; V 1:250



Revision	Created	Checked	Reviewed	Approved	Authorised
dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy
P01	07/03/22	08/03/22	08/03/22	08/03/22	---

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A66 NTP Integrated Project Team

Client
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 Manchester
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highways england

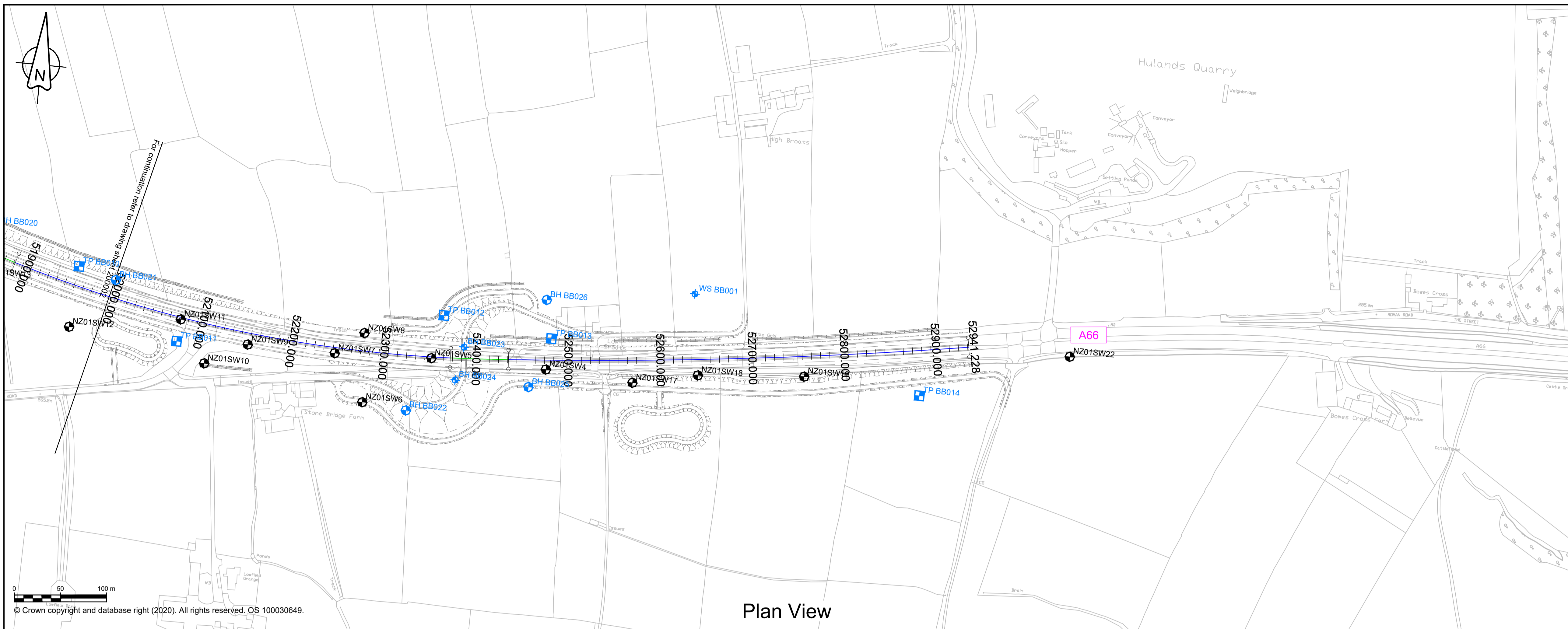
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Bowes Bypass
 Geological Long Section
 Sheet 2 of 3**

Project Ref. No.	Stage	Scale: 1:2500 @ A1
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Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
 S07 -DR-CE-20002
 Location | Type | Role | Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01

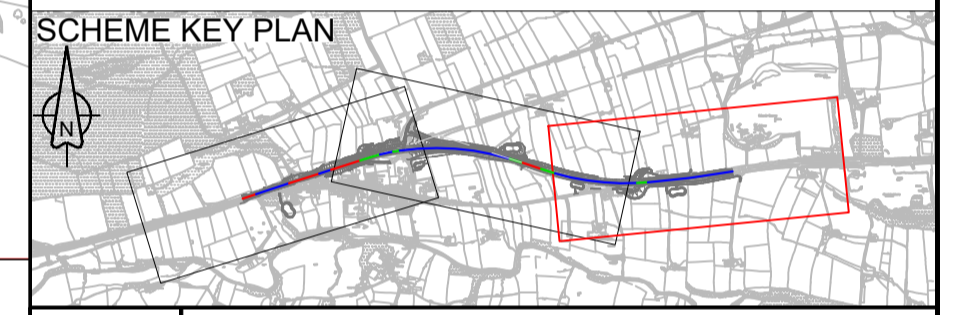


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- LAYOUT SHOWN IS DESIGN FREEZE D.

KEY
Plan

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 - ROAD NAMES
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 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - 2021 WINDOWLESS SAMPLES
 - 2021 ROTARY CORE HOLES
 - HISTORICAL ROTARY CORE HOLES
- BH - BOREHOLE
TP - TRIAL PIT
WS - WINDOW SAMPLE
HDP - HAND DUG PIT
SW - SURFACE WATER SAMPLE

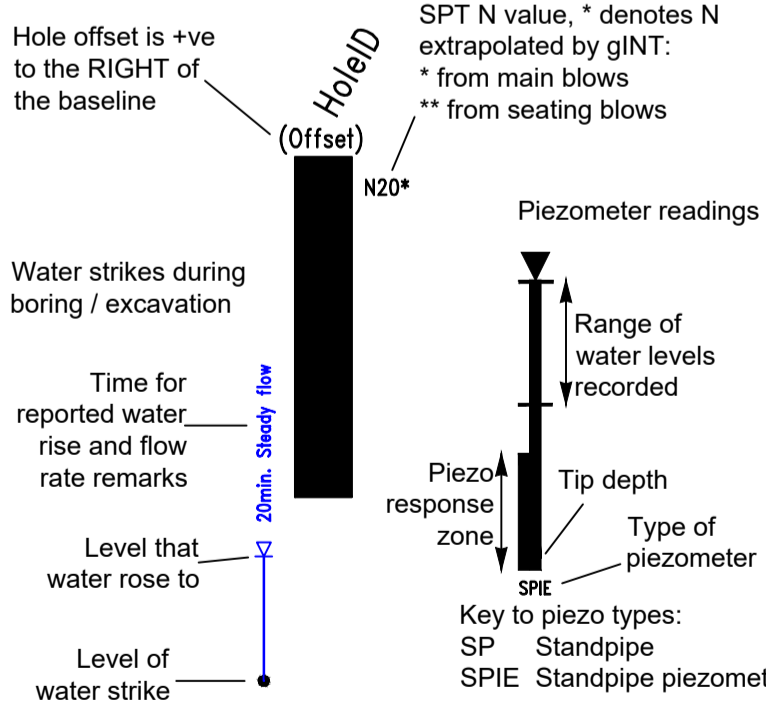


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Plan View

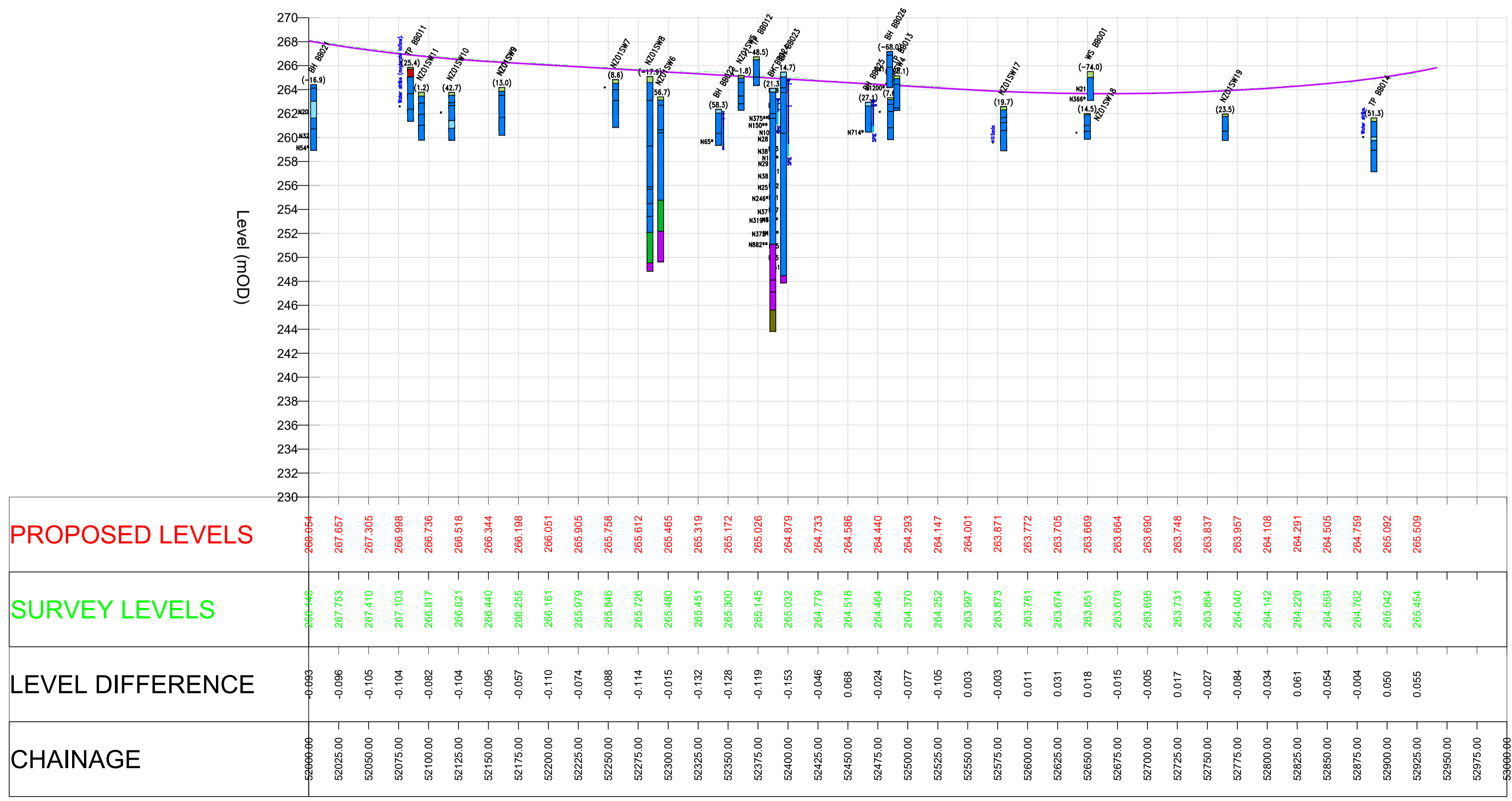
KEY
Profile

- PROPOSED VERTICAL DESIGN LEVEL
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- GLACIAL DEPOSITS - COHESIVE
- GLACIAL DEPOSITS - GRANULAR
- PEAT
- MUDSTONE
- LIMESTONE
- SANDSTONE



Profile View

Scale H 1:2500; V 1:250



For Information					
JBEL	MSAL	MSAL	MSAL	MSAL	---
07/03/22	08/03/22	08/03/22	08/03/22	08/03/22	---

Revision details					
Created	Checked	Reviewed	Approved	Authorised	
dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

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Project Name
A66 Northern Trans-Pennine

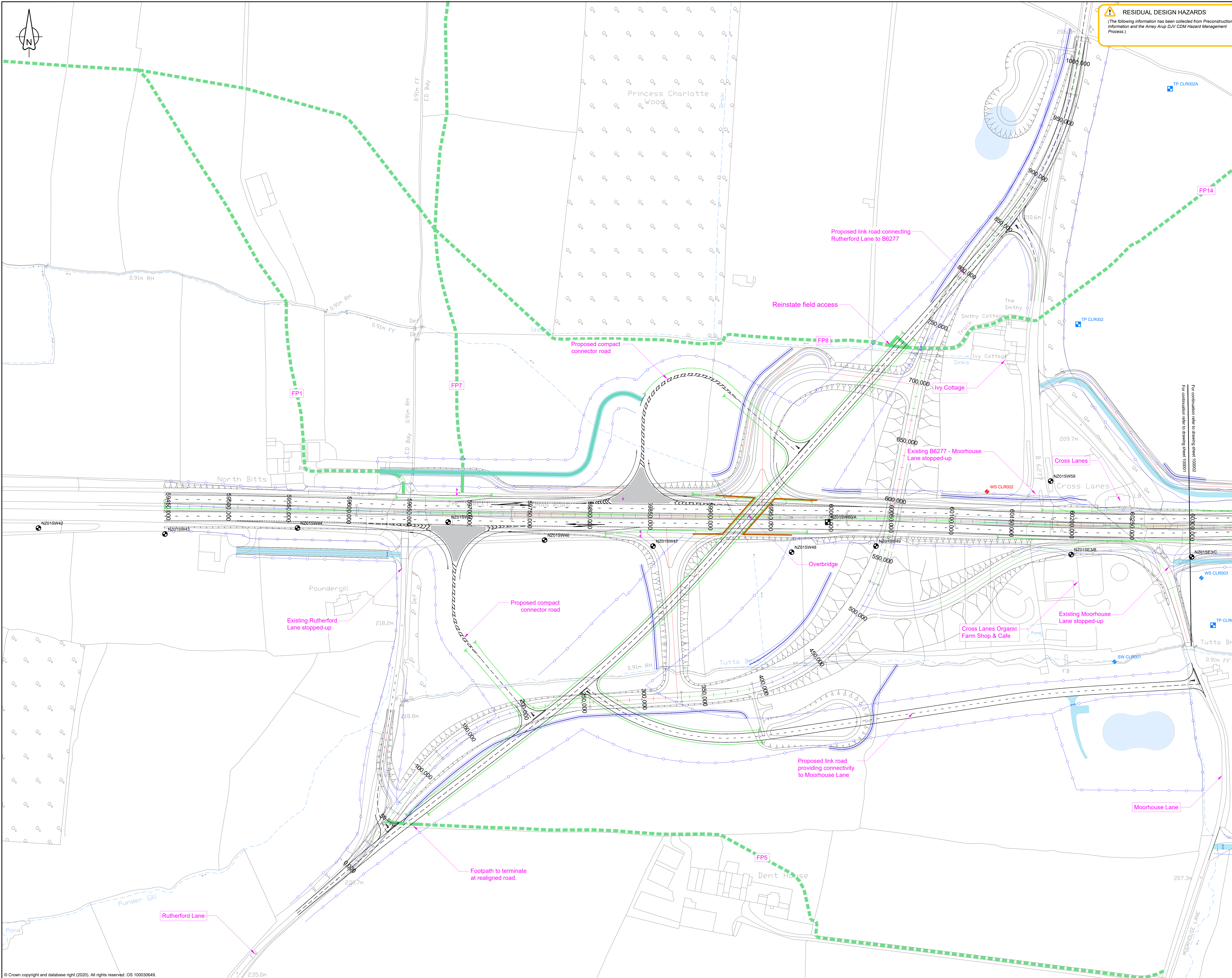
Drawing Title
**Bowes Bypass
Geological Long Section
Sheet 3 of 3**

Project Ref. No.	Stage	Scale	@ A1
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		Dimensions	M

Drawing Number
Project | Originator | Volume |
HE565627 - AMY - HGT -
S07 -DR-CE-20003
Location | Type | Role | Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P01

A.2 Scheme 8



RESIDUAL DESIGN HAZARDS
 (The following information has been collected from Preconstruction Information and the Amey Arup DJV CDM Hazard Management Process.)

- NOTES**
- All levels are in metres above Ordnance Datum.
 - All dimensions are in metres unless otherwise stated.
 - This drawing is to be read in conjunction with all other relevant drawings and the accompanying technical note HE565627-AMY-HGN-S08-TN-CH-00001.
 - The drainage design is of a sufficient level of detail to allow land take requirements and early stage design feasibility. Further design development to be undertaken.
 - The culvert naming convention is scheme specific for design coordination purposes only. A more detailed naming convention is to be agreed at a later design stage.
 - The vehicle restraint system layout is a high level assessment and requires a detailed risk assessment (RRAP) of the hazards present in the design.
 - Road markings, lighting columns and structures are indicative only and require further design development.
 - Traffic sign faces and locations are indicative only. Traffic signs will be developed at detailed design.
 - Boundary treatments, such as fencing, are subject to agreement with landowners and detailed design.
 - Proposed walking, cycling and horse riding routes are indicative only and subject to agreement with local authority and landowners.
 - A high level assessment of technology requirements has been completed, with allowance made in the red line boundary for any new installations.
 - Layout shown is Design Freeze D Black Option.

- KEY**
- Green line boundary
 - Existing layout
 - Existing watercourse
 - Proposed layout
 - Highway structure
 - Culvert
 - Cut-off drain
 - Filter Drain
 - Proposed boundary treatment
 - Proposed gate
 - Traffic sign
 - Proposed lighting column
 - Proposed vehicle restraint system
 - Headwall
 - Pipe to Outfall
 - Earthworks
 - Pond
 - Proposed Bridleway
 - Abandoned Bridleway
 - Existing Bridleway
 - Proposed Footway/Footpath
 - Abandoned Footway/Footpath
 - Existing Footway/Footpath
 - Proposed Shared Cycle Footway
 - Abandoned Shared Cycle Footway
 - Existing Shared Cycle Footway
 - Farm Track/Access
 - Temporary Compound/Storage Area
 - Demolished buildings
 - ACNB
 - Potential Environmental Mitigation
 - 2021 CABLE PERCUSSIVE HOLES
 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - PLANNED TRIAL PITS NOT UNDERTAKEN
 - 2021 WINDOWLESS SAMPLES
 - PLANNED WINDOWLESS SAMPLES NOT UNDERTAKEN
 - 2021 ROTARY CORE HOLES
 - HISTORICAL ROTARY CORE HOLES
 - BH - BOREHOLE
 - TP - TRIAL PIT
 - WS - WINDOW SAMPLE
 - HDP - HAND DUG PIT
 - SW - SURFACE WATER SAMPLE

P01	JBEL	MSAL	MSAL	MSAL	MSAL
	07/03/22	08/03/22	08/03/22	08/03/22	08/03/22
P02	MSAL	MSAL	MSAL	MSAL	MSAL
	08/03/22	08/03/22	08/03/22	08/03/22	08/03/22
Revision details					
Revision	Created	Checked	Reviewed	Approved	Authorised
	d8mmjy	d8mmjy	d8mmjy	d8mmjy	d8mmjy

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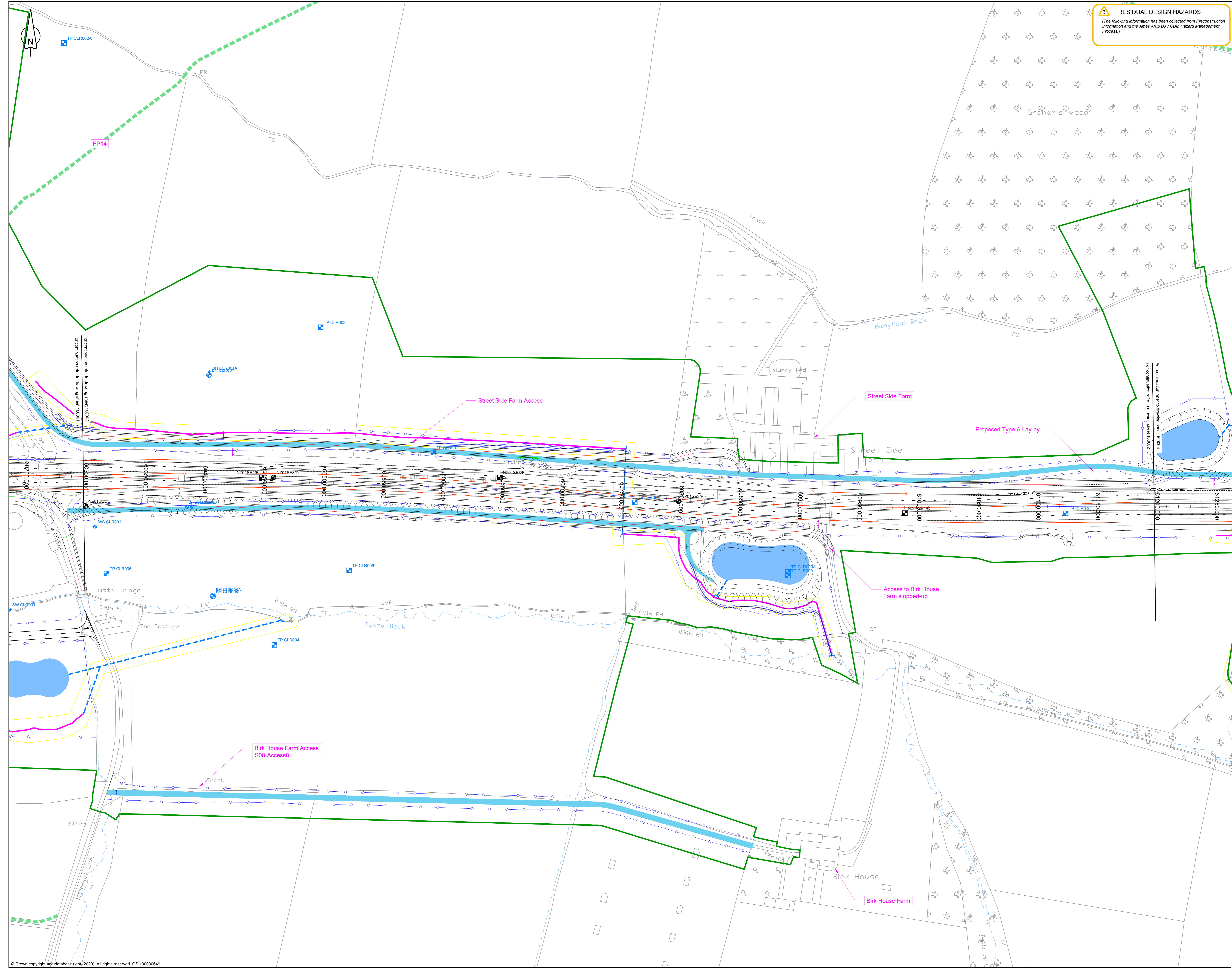
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 8: Cross Lanes to Rokeby
 Black Option
 As Built Exploratory Hole Plan
 Sheet 1 of 5**

Project Ref. No.	Stage	Scale : 1:1000	@ A0
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Drawing Number	Project	Originator	Volume
HE565627 - AMY - HGT - S08	-DR-CE - 100001		
Location	Type	Role	Number

Suitability	Suitability Description	Revision
S4	Fit for Stage Approval	P02



RESIDUAL DESIGN HAZARDS
 (The following information has been collected from Preconstruction Information and the Amey Arup DJV CDM Hazard Management Process.)

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- All levels are in metres above Ordnance Datum.
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 - Layout shown is Design Freeze D Black Option.

- KEY**
- Green line boundary
 - Existing layout
 - Existing watercourse
 - Proposed layout
 - Highway structure
 - Culvert
 - Cut-off drain
 - Filter Drain
 - Proposed boundary treatment
 - Proposed gate
 - Traffic sign
 - Proposed lighting column
 - Proposed vehicle restraint system
 - Headwall
 - Pipe to Outfall
 - Earthworks
 - Pond
 - Proposed Brideway
 - Abandoned Brideway
 - Existing Footway/Footpath
 - Proposed Footway/Footpath
 - Abandoned Footway/Footpath
 - Existing Shared Cycle Footway
 - Proposed Shared Cycle Footway
 - Abandoned Shared Cycle Footway
 - Existing Shared Cycle Footway
 - Farm Track/Access
 - Temporary Compound/Storage Area
 - Demolished buildings
 - ACNB
 - Potential Environmental Mitigation
 - 2021 CABLE PERCUSSIVE HOLES
 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - PLANNED TRIAL PITS NOT UNDERTAKEN
 - 2021 WINDOWLESS SAMPLES
 - PLANNED WINDOWLESS SAMPLES NOT UNDERTAKEN
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	07/03/22	08/03/22	08/03/22	08/03/22	---
Revision details					
Revision	Created	Checked	Reviewed	Approved	Authorised
	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

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highways
 england

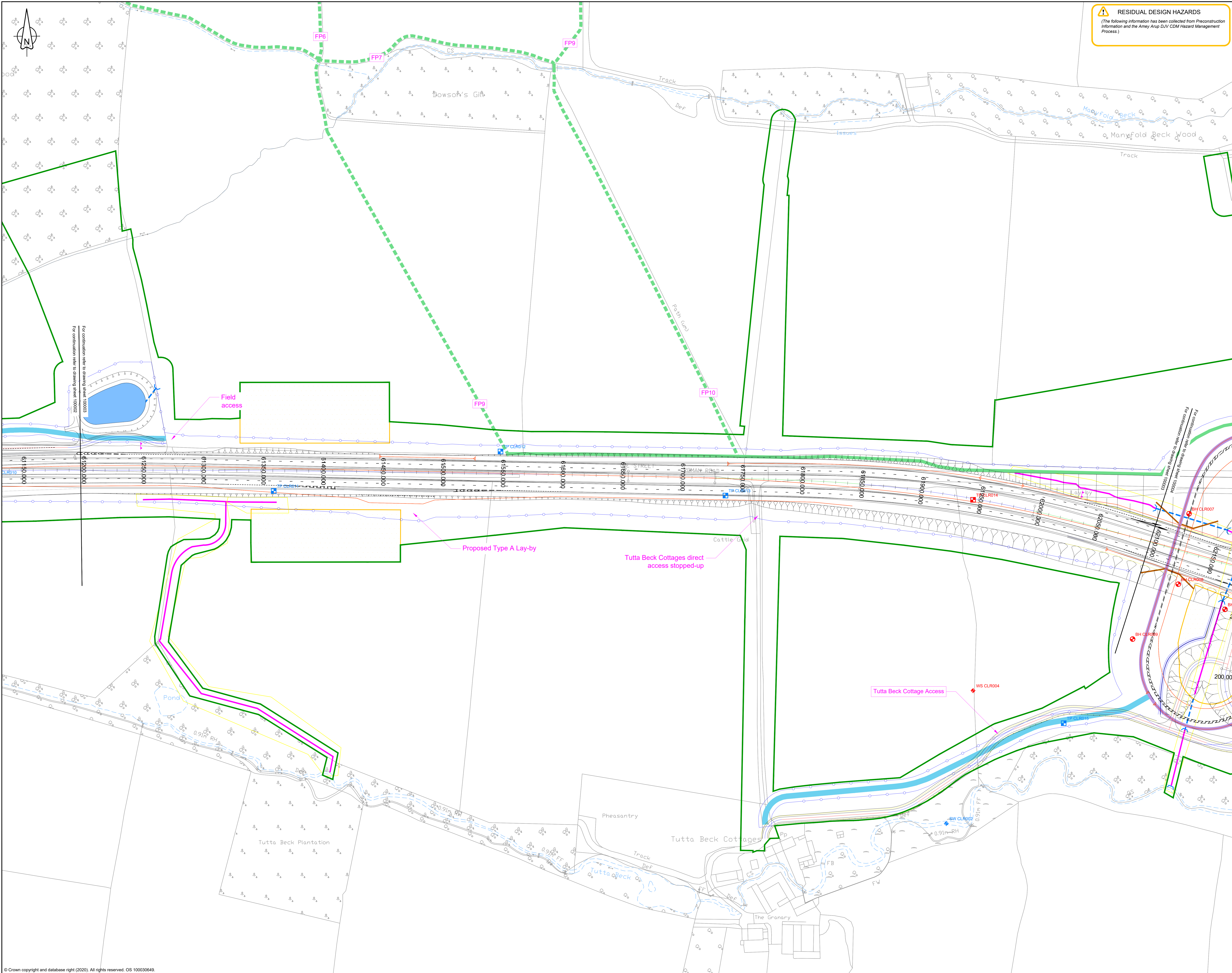
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 8: Cross Lanes to Rokeby
 Black Option
 As Built Exploratory Hole Plan
 Sheet 2 of 5**

Project Ref. No.	Stage	Scale: 1:1000	@ A0

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S08 -DR-CE - 100002
 Location | Type | Role | Number

Suitability | Suitability Description | Revision
S4 | Fit for Stage Approval | P01



RESIDUAL DESIGN HAZARDS
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Revision	Created	Checked	Reviewed	Approved	Authorised
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P01	JBEL	MSAL	MSAL	MSAL	---
	07/03/22	08/03/22	08/03/22	08/03/22	---

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Client
 3 Piccadilly Place
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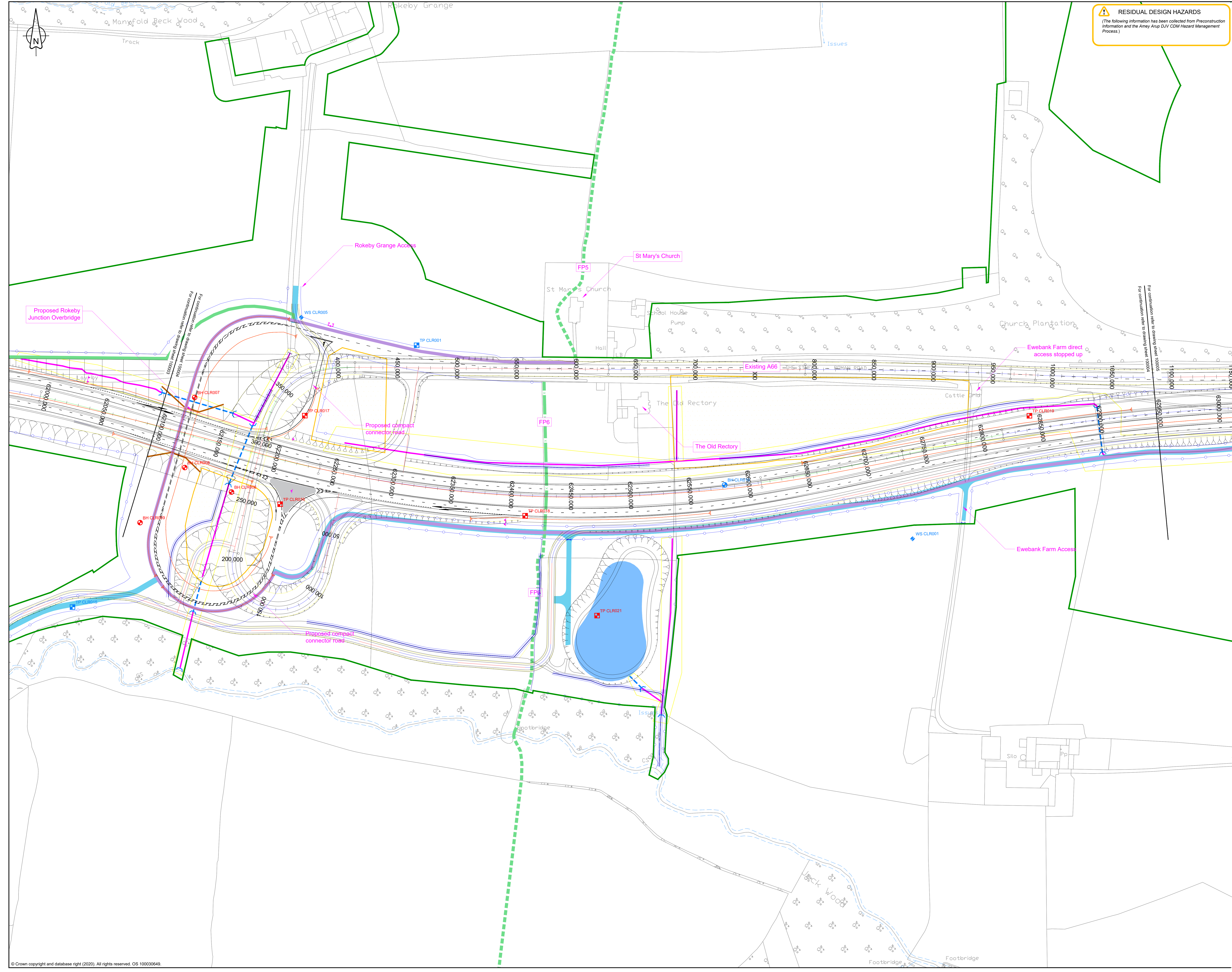
Project Name
 A66 Northern Trans-Pennine

Drawing Title
 Scheme 8: Cross Lanes to Rokeby
 Black Option
 As Built Exploratory Hole Plan
 Sheet 3 of 5

Project Ref. No. Stage Scale: 1:1000 @ A0
 --- Dimensions: M

Drawing Number
 Project | Originator | Volume |
 HE565627 - AMY - HGT -
 S08 -DR-CE - 100003
 Location | Type | Role | Number

Suitability Suitability Description Revision
 S4 Fit for Stage Approval P01



RESIDUAL DESIGN HAZARDS
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P01	JBEL	MSAL	MSAL	MSAL	---
	07/03/22	08/03/22	08/03/22	08/03/22	---
Revision	Created	Checked	Reviewed	Approved	Authorised
	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy	dd/mm/yy

Designer
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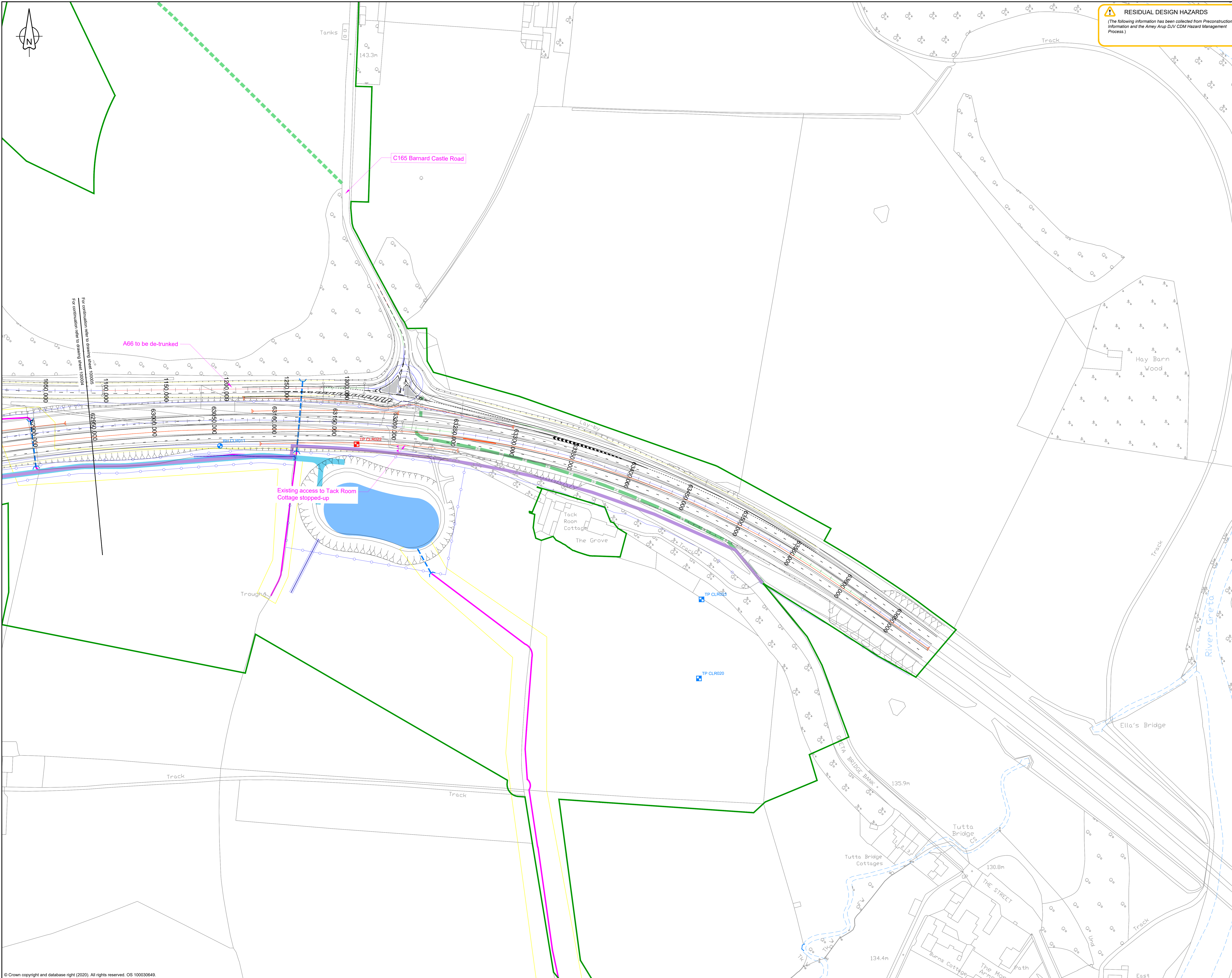
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 8: Cross Lanes to Rokeby
 Black Option
 As Built Exploratory Hole Plan
 Sheet 4 of 5**

Project Ref. No.	Stage	Scale : 1:1000	@ A0

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S08 -DR-CE - 100004
 Location | Type | Role | Number

Suitability | Suitability Description | Revision
S4 | **Fit for Stage Approval** | **P01**



RESIDUAL DESIGN HAZARDS
 (The following information has been collected from Preconstruction Information and the Amey Arup DJV CDM Hazard Management Process.)

- NOTES**
- All levels are in metres above Ordnance Datum.
 - All dimensions are in metres unless otherwise stated.
 - This drawing is to be read in conjunction with all other relevant drawings and the accompanying technical note HE565627-AMY-HGN-S08-TN-CH-000001.
 - The drainage design is of a sufficient level of detail to allow land take requirements and early stage design feasibility. Further design development to be undertaken.
 - The culvert naming convention is scheme specific for design coordination purposes only. A more detailed naming convention is to be agreed at a later design stage.
 - The vehicle restraint system layout is a high level assessment and requires a detailed risk assessment (RRRAP) of the hazards present in the design.
 - Road markings, lighting columns and structures are indicative only and require further design development.
 - Traffic sign faces and locations are indicative only. Traffic signs will be developed at detailed design.
 - Boundary treatments, such as fencing, are subject to agreement with landowners and detailed design.
 - Proposed walking, cycling and horse riding routes are indicative only and subject to agreement with local authority and landowners.
 - A high level assessment of technology requirements has been completed, with allowance made in the red line boundary for any new installations.
 - Layout shown is Design Freeze D Black Option.

- KEY**
- Green line boundary
 - Existing layout
 - Existing watercourse
 - Proposed layout
 - Highway structure
 - Culvert
 - Cut-off drain
 - Filter Drain
 - Proposed boundary treatment
 - Proposed gate
 - Traffic sign
 - Proposed lighting column
 - Proposed vehicle restraint system
 - Headwall
 - Pipe to Outfall
 - Earthworks
 - Pond
 - Proposed Brideway
 - Abandoned Brideway
 - Existing Brideway
 - Proposed Footway/Footpath
 - Abandoned Footway/Footpath
 - Existing Footway/Footpath
 - Proposed Shared Cycle Footway
 - Abandoned Shared Cycle Footway
 - Existing Shared Cycle Footway
 - Farm Track/Access
 - Temporary Compound/Storage Area
 - Demolished buildings
 - ACNB
 - Potential Environmental Mitigation
 - 2021 CABLE PERCUSSIVE HOLES
 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - PLANNED TRIAL PITS NOT UNDERTAKEN
 - 2021 WINDOWLESS SAMPLES
 - PLANNED WINDOWLESS SAMPLES NOT UNDERTAKEN
 - 2021 ROTARY CORE HOLES
 - HISTORICAL ROTARY CORE HOLES
 - BH - BOREHOLE
 - TP - TRIAL PIT
 - WS - WINDOW SAMPLE
 - HDP - HAND DUG PIT
 - SW - SURFACE WATER SAMPLE

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P01	JBEL	MSAL	MSAL	MSAL	---
	07/03/22	08/03/22	08/03/22	08/03/22	---
Revision	Created	Checked	Reviewed	Approved	Authorised
	sd/mm/yy	sd/mm/yy	sd/mm/yy	sd/mm/yy	sd/mm/yy

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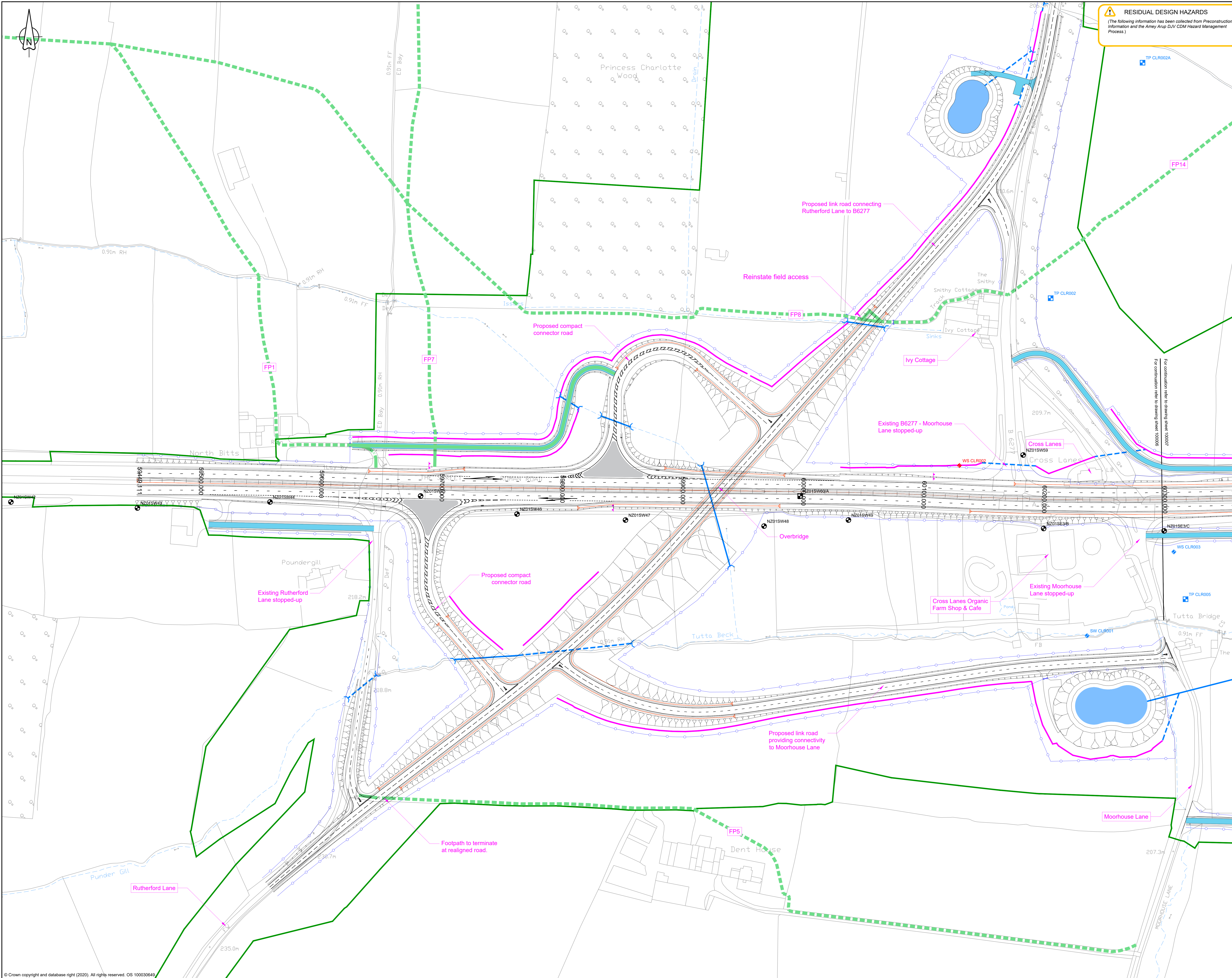
Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 8: Cross Lanes to Rokeby
 Black Option
 As Built Exploratory Hole Plan
 Sheet 5 of 5**

Project Ref. No. Stage Scale: 1:1000 @ A0
 --- Dimensions: M

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S08 -DR-CE - 100005
 Location | Type | Role | Number

Suitability | Suitability Description | Revision
S4 | Fit for Stage Approval | P01



RESIDUAL DESIGN HAZARDS
 (The following information has been collected from Preconstruction Information and the Amey Arup DJV CDM Hazard Management Process.)

- NOTES**
- All levels are in metres above Ordnance Datum.
 - All dimensions are in metres unless otherwise stated.
 - This drawing is to be read in conjunction with all other relevant drawings and the accompanying technical note HE565627-AMY-HGN-S08-TN-CH-000001.
 - The drainage design is of a sufficient level of detail to allow land take requirements and early stage design feasibility. Further design development to be undertaken.
 - The culvert naming convention is scheme specific for design coordination purposes only. A more detailed naming convention is to be agreed at a later design stage.
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 - Traffic sign faces and locations are indicative only. Traffic signs will be developed at detailed design.
 - Boundary treatments, such as fencing, are subject to agreement with landowners and detailed design.
 - Proposed walking, cycling and horse riding routes are indicative only and subject to agreement with local authority and landowners.
 - A high level assessment of technology requirements has been completed, with allowance made in the red line boundary for any new installations.
 - Layout shown is Design Freeze D Blue Option.

- KEY**
- Green line boundary
 - Existing layout
 - Existing watercourse
 - Proposed layout
 - Highway structure
 - Culvert
 - Cut-off drain
 - Filter Drain
 - Proposed boundary treatment
 - Proposed gate
 - Traffic sign
 - Proposed lighting column
 - Proposed vehicle restraint system
 - Headwall
 - Pipe to Outfall
 - Earthworks
 - Pond
 - Proposed Brideway
 - Abandoned Brideway
 - Existing Brideway
 - Proposed Footway/Footpath
 - Abandoned Footway/Footpath
 - Existing Footway/Footpath
 - Proposed Shared Cycle Footway
 - Abandoned Shared Cycle Footway
 - Existing Shared Cycle Footway
 - Farm Track/Access
 - Temporary Compound/Storage Area
 - Demolished buildings
 - ACNB
 - Potential Environmental Mitigation
 - 2021 CABLE PERCUSSIVE HOLES
 - HISTORICAL CABLE PERCUSSIVE HOLES
 - PLANNED CABLE PERCUSSIVE HOLES NOT UNDERTAKEN
 - 2021 TRIAL PITS
 - HISTORICAL TRIAL PITS
 - PLANNED TRIAL PITS NOT UNDERTAKEN
 - 2021 WINDOWLESS SAMPLES
 - PLANNED WINDOWLESS SAMPLES NOT UNDERTAKEN
 - 2021 ROTARY CORE HOLES
 - HISTORICAL ROTARY CORE HOLES
 - BH - BOREHOLE
 - TP - TRIAL PIT
 - WS - WINDOW SAMPLE
 - HDP - HAND DUG PIT
 - SW - SURFACE WATER SAMPLE

...
...
P01	JBEL	MSAL	MSAL	MSAL	...
	07/03/22	08/03/22	08/03/22	08/03/22	...
Revision	Created	Checked	Reviewed	Approved	Authorised
	d8mm/yy	d8mm/yy	d8mm/yy	d8mm/yy	d8mm/yy

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Project Name
A66 Northern Trans-Pennine

Drawing Title
**Scheme 8: Cross Lanes to Rokeby
 Blue Option
 As Built Exploratory Hole Plan
 Sheet 1 of 5**

Project Ref. No.	Stage	Scale: 1:1000	@ A0

Drawing Number
 Project | Originator | Volume |
HE565627 - AMY - HGT -
S08 -DR-CE - 100006
 Location | Type | Role | Number

Suitability | Suitability Description | Revision
S4 | Fit for Stage Approval | P01

B Methodology for Derivation of Material Properties

Geotechnical parameters for the strata encountered in exploratory holes located along schemes 7 and 8 have been derived from laboratory tests, literature sources and soil and rock descriptions. The methodologies used to derive these are outlined in the sections below.

The approach adopted is to derive a set of parameters for each scheme as a whole, whilst ensuring that they adequately represent local variations.

The parameters included in this report are for the purpose of developing a suitable specimen design. These should be treated as preliminary and should be given further consideration during the PCF design stage 4.

B.1 Bulk Density

The bulk density parameters provided have been chosen from guidance in BS8002:2015, supplemented with bulk density tests carried out as part of the 2021 and historical ground investigations, where available.

B.2 Classification

Classification of each stratum was undertaken using Natural Water Content (NWC), Atterberg Limit Tests, Particle Size Distribution (PSD) and Particle Density test results.

For rocks, rock water content tests have been presented separately from natural water content tests in soil to distinguish between tests carried out in weathered rock recovered as a soil and the bedrock. Rock water content tests were also carried out separately as part of Unconfined Compressive Strength (UCS) testing.

B.3 Shear Strength

Cohesive Soils

Undrained Shear Strength

Measured values of undrained shear strength (c_u) have been obtained from in-situ and laboratory hand shear vane measurements, and unconsolidated undrained triaxial tests (UU).

c_u has also been calculated from SPT N_{60} using the following equation [63]:

$$c_u = f_1 N_{60} \text{ (kPa)}$$

where:

f_1 is dependent on Plasticity Index as per the figure below.

N_{60} is SPT N values corrected for hammer energy ratio ($N_{60} = N \times Er/60$) where Er is the SPT hammer energy ratio.

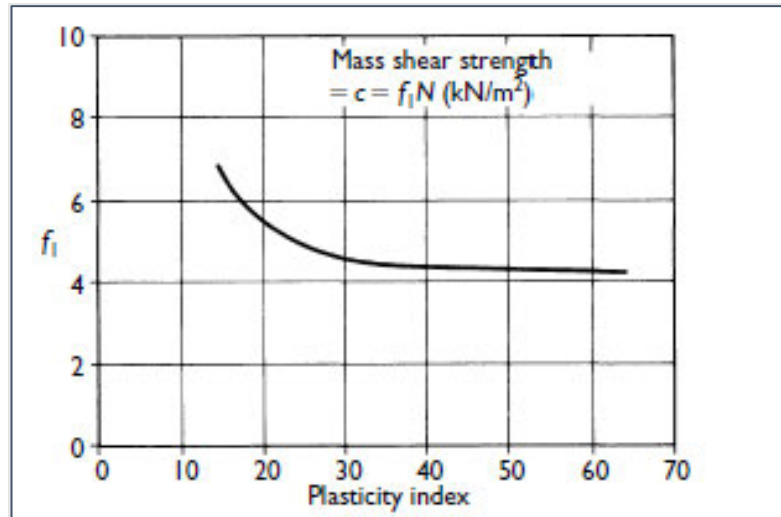


Figure B1: f_1 and relationship to Plasticity Index (reproduced from Tomlinson [63]).

Drained Shear Strength

Measured values of the angle of shearing resistance and effective cohesion have been obtained from consolidated undrained triaxial tests (CU), and direct shear tests.

The angle of shearing resistance has also been calculated using the following equation from BS8002:2015 [38]:

$$\phi'_{cv} = (42^\circ - 12.5 \log_{10}(I_P))$$

where:

I_P is the Plasticity Index entered as a percentage

ϕ'_{cv} is the soil's constant-volume angle of shearing resistance

It is noted that the peak angle of shearing resistance will be greater than ϕ'_{cv} for in-situ soils, due to the contribution from soil dilatancy.

The peak angle of shearing resistance has been evaluated from small shearbox testing on recompacted samples and consolidated undrained triaxial testing only.

In the absence of comprehensive testing data the constant volume effective cohesion c' has been assumed as zero as per guidance in BS8002:2015 [38]. Values of c' obtained from consolidated undrained triaxial testing have been presented, where recorded.

Granular soils

Angle of shearing resistance

Measured values of the angle of shearing resistance of granular soils have been obtained from direct shear tests.

The angle of shearing resistance has also been calculated from the relationships between SPT N value and the angle of shearing resistance presented by Peck et al (1974) [42]. SPT N_{60} values have been used for the purposes of this report.

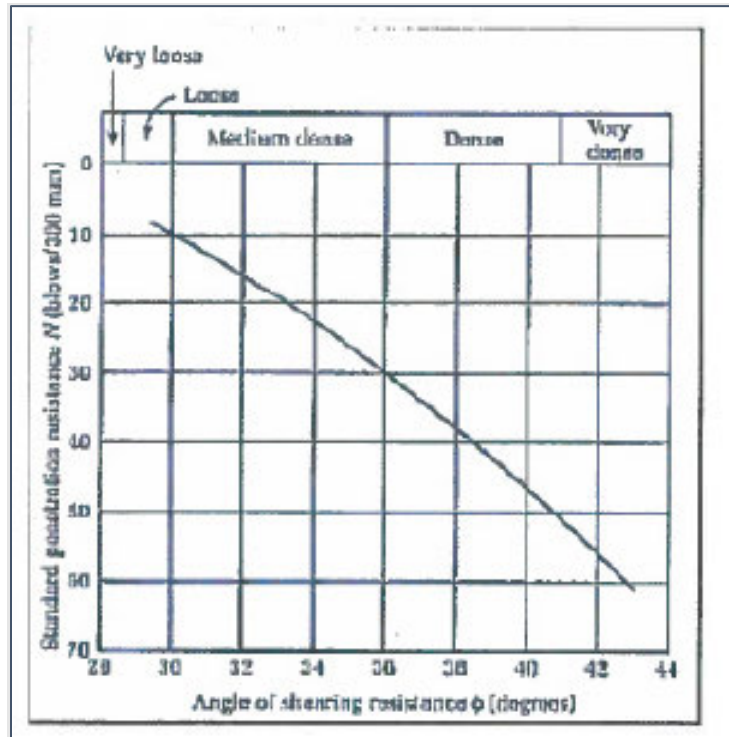


Figure B2: Relationship between NSPT value and angle of shearing resistance (Peck et al, 1974) [42]

In addition the critical state effective angle of shearing resistance of granular soils can be estimated from the below equations in accordance with guidance in BS 8002:2015 [38].

$$\phi'_{\text{critical}} = 30^\circ + \phi'_{\text{ang}} + \phi'_{\text{PSD}}$$

where

ϕ'_{ang} is the contribution from the angularity of the particles

ϕ'_{PSD} is the contribution from the soils' particle size

As for cohesive soils the peak friction angle has not been evaluated using this method.

Rocks

Unconfined compressive strength

An indication of the unconfined compressive strength (UCS) of rocks has been derived from the descriptions in the exploratory hole logs. The Figure B3 below presents an extract from BS 5930:2015 [64] which gives unconfined compressive strength ranges for each descriptive term.

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurements MPa
Extremely weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.	0.6 – 1.0
Very weak	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.	1 – 5
Weak	Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.	5 – 25
Medium strong	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.	25 – 50
Strong	Requires more than one blow of geological hammer to fracture.	50 – 100
Very strong	Requires many blows of geological hammer to fracture.	100 – 250
Extremely strong	Can only be chipped with geological hammer.	>250

NOTE Based on BS EN ISO 14689-1:2003 4.2.7, Table 5.

Figure B3: Unconfined compressive strength ranges (BS 5930:2015) [64]

10.6.9 Where point load tests have been carried out, these have been used to derive the UCS of rock using the following relationship:

$$UCS = C * I_{s(50)}$$

Where $I_{s(50)}$ is the point load index

C is a constant relating to the published or site-specific correlation. The following values of C have been adopted on this project:

- Mudstone: C=10
- Sandstone and limestone: C= 20

Direct measurements of strength from laboratory UCS tests have also been carried out as part of the 2021 ground investigation.

B.4 Compaction Characteristics

Laboratory CBR tests were carried out as part of the 2021 ground investigation. These tests were carried out under soaked conditions and therefore the results represent a conservative, lower-bound estimate of the in-situ conditions. CBR has also been derived from in-situ plate load tests carried out at several trial pits locations during the 2021 ground investigation.

Compaction characteristics were assessed using standard laboratory tests. These comprised dry density/moisture content relationship determination, the majority were carried out using 4.5kg rammer apparatus with some tests on granular material carried out with vibrating rammer, and Moisture Condition Value (MCV).

The SHW places emphasis on achievement of adequate compaction of soils used as fill materials. This can be measured by determining the maximum dry density that can be achieved for soil from a particular area and stratum. The moisture content of the soil at the maximum dry density is the optimum amount. By definition, the relationship covers a range of moisture contents both on the dry

side and the wet side of this value. Depending on fill end use and plant, the SHW indicates an acceptable level of compaction, on an “end-product” or “method-related” basis and the range of moisture contents that are likely to achieve this requirement.

In addition to the standard compaction test described, the MCV test has been developed as a more rapid means of determining material suitability in the field, without the need to wait for moisture content determinations. Prior to MCV, field compliance testing meant that volumes of fill could potentially be placed and compacted outside the acceptable moisture content range, failing the specification and then requiring mitigation and in situ testing processes. The MCV test in the field does not rely on moisture content determination and instead an MCV value range is used to determine acceptability at the point of deposition in the field.

In order to determine the suitable MCV value range for different materials on a scheme, suitable MCV calibration and single point MCV determinations are used. For the schemes covered by this GIR, there are mixed soils present and in general the fine fraction of these mixtures determines behaviour of the overall matrix, even though the granular fraction may be up to 85% of the mixture. For these soils, the MCV is well-suited and single point and calibration tests have been undertaken. These are discussed in the scheme ground summary chapters.

For granular soils, the MCV test is less relevant as these have a structure which generally allows drainage during compaction. The MCV test procedure identifies PSDs that will not be suitable for the MCV test and the standard compaction test is the recommended route to suitability determination for granular soils.

Both single-point moisture condition value (MCV) tests and multi-point moisture content condition (MCC) tests were carried out as part of the 2021 ground investigation and have been used to derive the typical MCV of potential earthworks materials and the relationship between MCV and moisture content.

B.5 Consolidation and Compressibility/Stiffness

Cohesive Soils

Coefficient of volume compressibility (m_v)

The coefficient of volume compressibility has been derived on a scheme-wide basis due to the limit number of oedometer tests available. m_v values from the 50-100kPa loading increment of the oedometer tests have been used as this is typical of the surcharge from low embankments and representative of the proposed developments on the scheme.

Undrained Elastic Modulus (E_u)

The undrained elastic modulus for cohesive soils has not been derived in this report.

Drained Elastic Modulus (E')

The drained elastic modulus has been derived using the correlation by Tomlinson [63]:

$$E' = 1/m_v$$

The value of m_v derived on a scheme wide basis has been used. Where appropriate, the results have been compared to values of m_v derived from in-situ SPT results as follows:

$$m_v = 1/f_2 N_{60}$$

Where f_2 is dependent on the Plasticity Index as per the Figure 7 below.

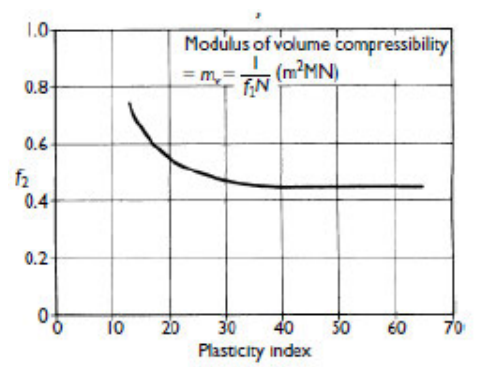


Figure B4– f_2 and relationship to Plasticity Index (reproduced from Tomlinson [63]).

Granular Soils

Elastic Modulus

For granular soils, elastic modulus was estimated from the SPT N_{60} value using the following equation (Stroud, 1989) in CIRIA 143 [43][43]:

$$E' = 1 \times N_{60}$$

B.6 Chemical testing

In the 2021 investigation, ground chemistry was assessed from the perspective of geotechnical and structural design and in order to evaluate geo-environmental impact.

For geotechnical and structural considerations, the main objective at the preliminary stage of design is evaluation of the presence of sulfate bearing soils. These have the potential to allow soluble sulfate compounds to come into contact with buried structural materials and are known to create severe problems with buried concrete and steel. BRE Special Digest 1 (SD1): Concrete in Aggressive Ground [44] provides a basis for assessment of the risks to buried concrete in particular, using a suite of tests for water soluble sulfate that can leach from the soil, whether immediately available or present in other sulfur compounds. The SD1 approach allows determination of the Design Sulfate (DS) class and Aggressive Chemical Environment for Concrete (ACEC) classification. These criteria are considered in the scheme ground summary chapters.

In addition to risks to buried concrete and steel, sulfate bearing soils will constrain soil improvement methods if they are required by later design. These methods, such as lime and/or cement improvement and stabilisation are adversely affected by the presence of soluble sulfate. Excessive consumption of lime and soil swelling are issues that can arise and these are considered where relevant later in Chapter 10.

C List of Exploratory Hole Locations

Source / Date	Hole ID	Hole Type	7.1	7.2	7.3	7.4	7.5
Durham County Council, 1975 (British Geological Survey)	NY91SE23	Cable percussive borehole	✓	✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE24	Cable percussive borehole	✓	✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE25	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE26	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE27	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE28	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE29	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE30	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE31	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE32	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE33	Cable percussive borehole	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE34	Cable percussive borehole	✓				
Durham County Council, 1979 (British Geological Survey)	NY91SE44/A	Cable percussive borehole	✓				
Durham County Council, 1979 (British Geological Survey)	NY91SE44/D	Cable percussive borehole	✓				
Allied Exploration Geotechnics Ltd, 2021.	WS BB002	Window sampling borehole	✓				
Allied Exploration Geotechnics Ltd, 2021.	BH BB002	Rotary open hole	✓				
Allied Exploration Geotechnics Ltd, 2021.	BH BB003	Rotary core & rotary open hole follow on	✓				
Allied Exploration Geotechnics Ltd, 2021.	BH BB004	Cable percussive borehole	✓				
Allied Exploration Geotechnics Ltd, 2021.	BH BB005	Cable percussive borehole	✓				
Allied Exploration Geotechnics Ltd, 2021.	BH BB006	Cable percussive borehole	✓				

Allied Exploration Geotechnics Ltd, 2021.	BH BB007	Cable percussive borehole & rotary core follow on	✓	✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB008	Cable percussive borehole & rotary core follow on	✓	✓			
Allied Exploration Geotechnics Ltd, 2021.	TP BB001	Trial Pit	✓				
Allied Exploration Geotechnics Ltd, 2021.	TP BB002	Trial Pit	✓	✓			
Allied Exploration Geotechnics Ltd, 2021.	TP BB005	Trial Pit	✓				
Durham County Council, 1974 (British Geological Survey)	NY91SE10	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE15	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE14	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE16	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE17	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE18	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE19	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE20	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE21	Cable Percussion		✓			
Durham County Council, 1974 (British Geological Survey)	NY91SE21A	Cable Percussion		✓			
Durham County Council, 1979 (British Geological Survey)	NY91SE44/B	Cable Percussion		✓			
Durham County Council, 1979 (British Geological Survey)	NY91SE44/C	Cable Percussion		✓			
Durham County Council, 1975 (British Geological Survey)	NY91SE5	Cable Percussion		✓	✓		
Durham County Council, 1974 (British Geological Survey)	NY91SE6	Cable Percussion		✓			
Durham County Council, 1975 (British Geological Survey)	NY91SE7	Cable Percussion		✓			
Durham County Council, 1975 (British Geological Survey)	NY91SE8	Cable Percussion		✓			

Allied Exploration Geotechnics Ltd, 2021.	BH BB009	Cable percussive borehole & rotary core follow on		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB010	Cable percussive borehole & rotary core follow on		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB011	Cable percussive borehole & rotary core follow on		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB012	Cable percussive borehole & rotary core follow on		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB013	Cable percussive borehole		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB014	Cable percussive borehole & rotary core follow on		✓			
Allied Exploration Geotechnics Ltd, 2021.	BH BB015	Cable percussive borehole		✓	✓		
Allied Exploration Geotechnics Ltd, 2021.	TP BB003	Trial Pit		✓			
Allied Exploration Geotechnics Ltd, 2021.	TP BB004	Trial Pit		✓			
Allied Exploration Geotechnics Ltd, 2021.	TP BB006	Trial Pit		✓			
Allied Exploration Geotechnics Ltd, 2021.	TP BB007	Trial Pit		✓			
Allied Exploration Geotechnics Ltd, 2021.	HDP BB001	Hand-dug trial pit		✓			
Durham County Council, 1974 (British Geological Survey)	NZ01SW14	Cable percussive borehole			✓		
Durham County Council, 1974 (British Geological Survey)	NZ01SW15	Cable percussive borehole			✓		
Durham County Council, 1975 (British Geological Survey)	NZ01SW16	Cable percussive borehole			✓		
Durham County Council, 1979 (British Geological Survey)	NZ01SW58	Cable percussive borehole			✓	✓	
Allied Exploration Geotechnics Ltd, 2021.	BH BB016	Cable percussive borehole			✓		
Allied Exploration Geotechnics Ltd, 2021.	BH BB017	Cable percussive borehole			✓		
Allied Exploration Geotechnics Ltd, 2021.	BH BB018	Cable percussive borehole & rotary core follow on			✓	✓	
Allied Exploration Geotechnics Ltd, 2021.	TP BB008	Trial Pit			✓		
Allied Exploration Geotechnics Ltd, 2021.	TP BB009	Trial Pit			✓	✓	

Durham County Council, 1974 (British Geological Survey)	NZ01SW10	Cable percussive borehole				✓	
Durham County Council, 1974 (British Geological Survey)	NZ01SW11	Cable percussive borehole				✓	
Durham County Council, 1974 (British Geological Survey)	NZ01SW12	Cable percussive borehole				✓	
Durham County Council, 1974 (British Geological Survey)	NZ01SW13	Cable percussive borehole				✓	
Durham County Council, 1975 (British Geological Survey)	NZ01SW17	Cable percussive borehole				✓	
Durham County Council, 1975 (British Geological Survey)	NZ01SW18	Cable percussive borehole				✓	
Durham County Council, 1975 (British Geological Survey)	NZ01SW19	Cable percussive borehole				✓	
Durham County Council, 1975 (British Geological Survey)	NZ01SW22	Cable percussive borehole				✓	
Durham County Council, 1974 (British Geological Survey)	NZ01SW2	Cable percussive borehole					✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW4	Cable percussive borehole				✓	✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW5	Cable percussive borehole				✓	✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW6	Cable percussive borehole				✓	✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW7	Cable percussive borehole				✓	✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW8	Cable percussive borehole				✓	✓
Durham County Council, 1974 (British Geological Survey)	NZ01SW9	Cable percussive borehole				✓	
Allied Exploration Geotechnics Ltd, 2021.	BH BB019	Cable percussive borehole				✓	
Allied Exploration Geotechnics Ltd, 2021.	BH BB020	Cable percussive borehole & rotary core follow on				✓	
Allied Exploration Geotechnics Ltd, 2021.	BH BB021	Cable percussive borehole				✓	
Allied Exploration Geotechnics Ltd, 2021.	BH BB022	Cable percussive borehole				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	BH BB023	Cable percussive borehole & rotary core follow on				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	BH BB024	Cable percussive borehole & rotary core follow on				✓	✓

Allied Exploration Geotechnics Ltd, 2021.	BH BB025	Cable percussive borehole				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	BH BB026	Cable percussive borehole				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	WS BB001	Window sample borehole				✓	
Allied Exploration Geotechnics Ltd, 2021.	TP BB010	Trial Pit				✓	
Allied Exploration Geotechnics Ltd, 2021.	TP BB011	Trial Pit				✓	
Allied Exploration Geotechnics Ltd, 2021.	TP BB012	Trial Pit				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	TP BB013	Trial Pit				✓	✓
Allied Exploration Geotechnics Ltd, 2021.	TP BB014	Trial Pit				✓	

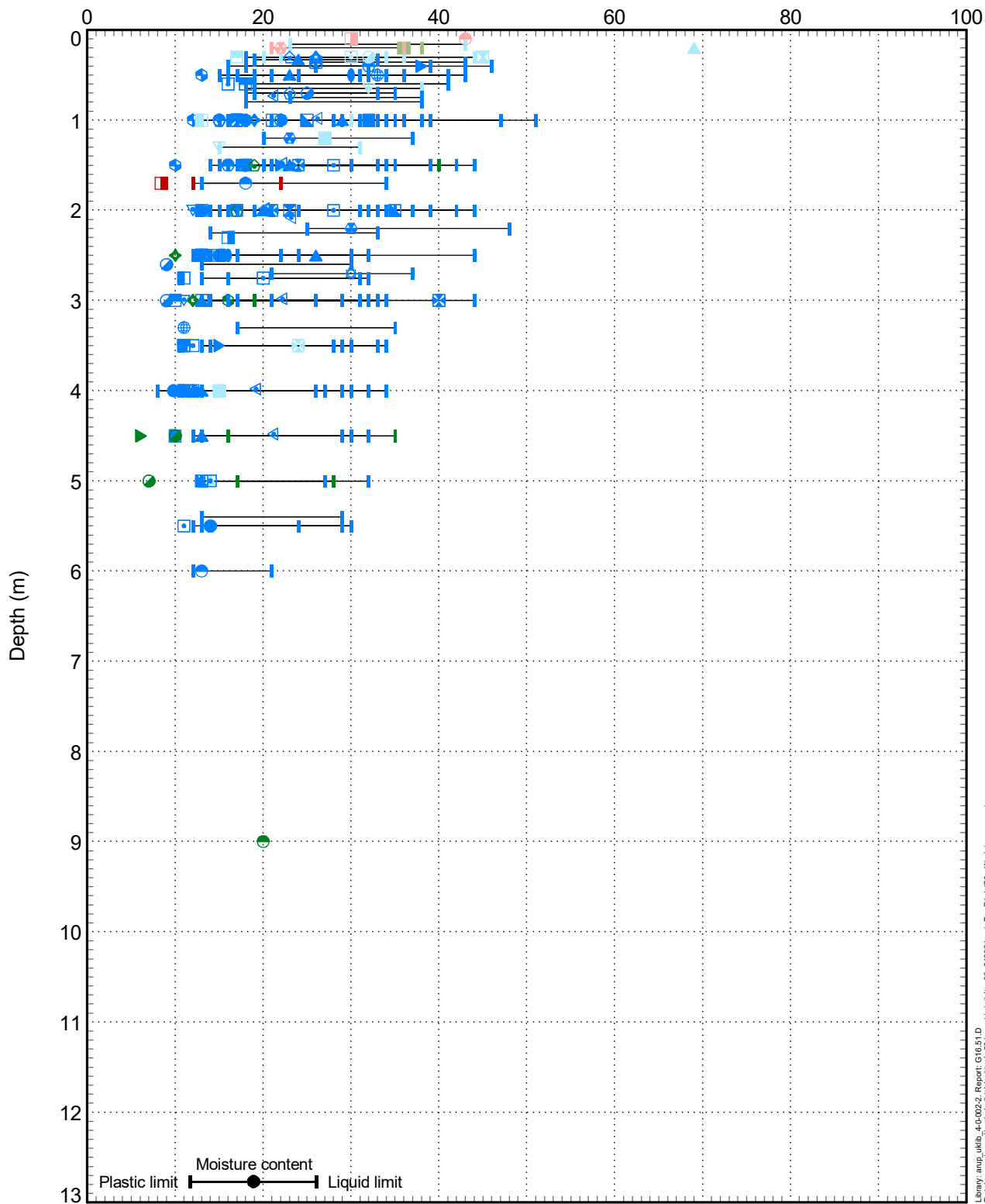
Source / Date	Hole ID	Hole Type	8.1	8.2	8.3	8.4
Durham County Council, 1981 (British Geological Survey)	NZ01SE3/B	Cable percussive borehole	✓	✓		
Durham County Council, 1975 (British Geological Survey)	NZ01SW43	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW44	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW45	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW46	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW47	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW48	Cable percussive borehole	✓			
Durham County Council, 1975 (British Geological Survey)	NZ01SW49	Cable percussive borehole	✓			
Durham County Council, 1981 (British Geological Survey)	NZ01SW59	Cable percussive borehole	✓	✓		
Durham County Council, 1983 (British Geological Survey)	NZ01SW60/A	Cable percussive borehole	✓			
Allied Exploration Geotechnics Ltd, 2021.	TP CLR002	Trial Pit	✓	✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR001	Cable percussive borehole		✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR001A	Cable percussive borehole & rotary core/rotary open hole follow on		✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR003	Cable percussive borehole & rotary core follow on		✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR003A	Rotary core & rotary open hole follow on		✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR004	Cable percussive borehole		✓		
Allied Exploration Geotechnics Ltd, 2021	BH CLR004A	Cable percussive borehole & rotary core/rotary open hole follow on		✓		
Allied Exploration Geotechnics Ltd, 2021	SW CLR001	Surface water groundwater sampling location		✓		
Allied Exploration Geotechnics Ltd, 2021	WS CLR003	Window sampling borehole		✓		
Durham County Council, 1981 (British Geological Survey)	NZ01SE3/C	Cable percussive borehole		✓		

Durham County Council, 1981 (British Geological Survey)	NZ01SE3/D	Cable percussive borehole		✓		
Durham County Council, 1981 (British Geological Survey)	NZ01SE3/E	Cable percussive borehole		✓		
Durham County Council, 1981 (British Geological Survey)	NZ01SE3/F	Cable percussive borehole		✓		
Durham County Council, 1983 (British Geological Survey)	NZ01SE4/B	Cable percussive borehole		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR002A	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR003	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR004	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR005	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR006	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR007	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR008	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR009	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR009A	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR010	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR011	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR012	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	TP CLR013	Trial Pit		✓		
Durham County Council, 1983 (British Geological Survey)	NZ01SE4/C	Trial Pit		✓		
Allied Exploration Geotechnics Ltd, 2021	SW CLR002	Surface water groundwater sampling location			✓	
Allied Exploration Geotechnics Ltd, 2021	WS CLR005	Window sampling borehole			✓	
Allied Exploration Geotechnics Ltd, 2021	TP CLR001	Trial Pit			✓	
Allied Exploration Geotechnics Ltd, 2021	TP CLR015	Trial Pit			✓	
Allied Exploration Geotechnics Ltd, 2021	BH CLR010	Cable percussive borehole				✓

Allied Exploration Geotechnics Ltd, 2021	BH CLR011	Cable percussive borehole				✓
Allied Exploration Geotechnics Ltd, 2021	WS CLR001	Window sampling borehole				✓
Allied Exploration Geotechnics Ltd, 2021	TP CLR020	Trial Pit				✓
Allied Exploration Geotechnics Ltd, 2021	TP CLR023	Trial Pit				✓

D Plots of laboratory and in-situ testing

Moisture content (%)



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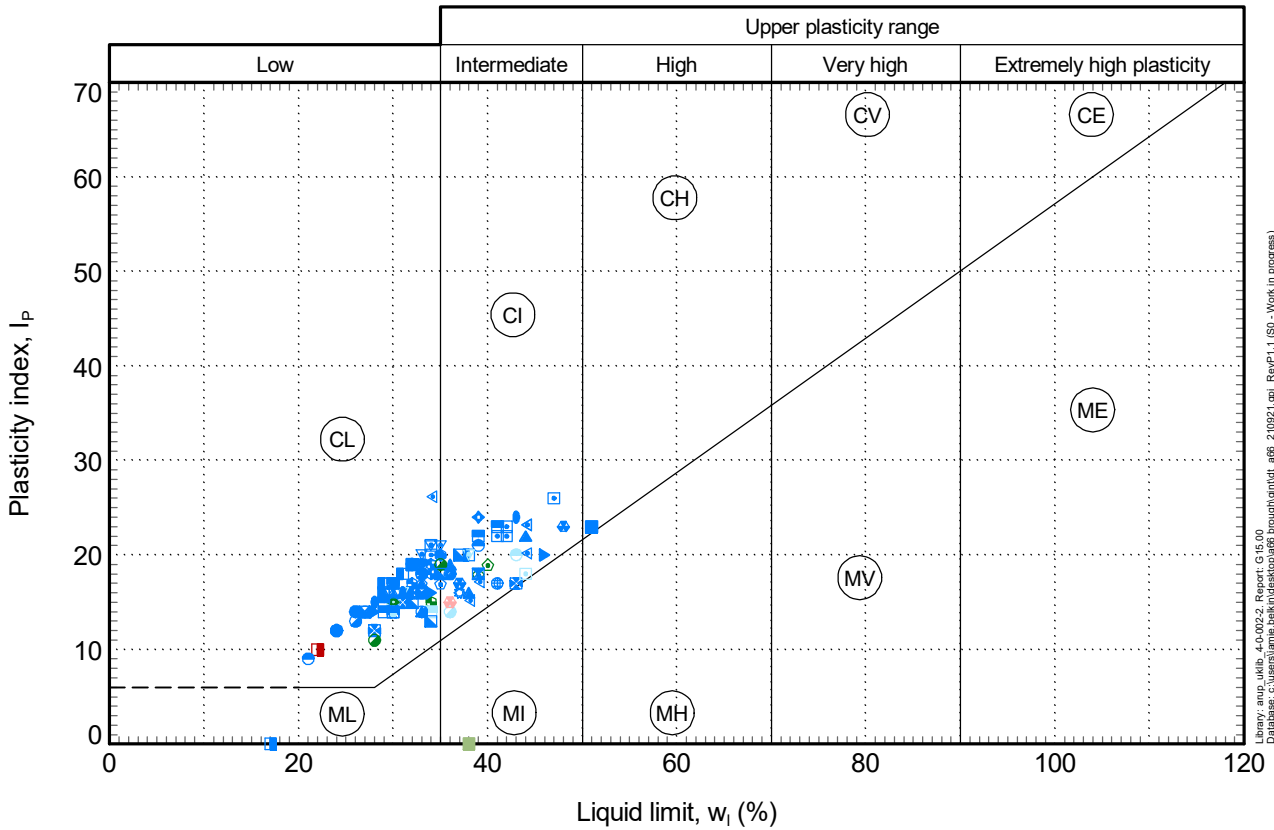
<ul style="list-style-type: none"> ■ Mudstone (RK-Mdst) ■ Made Ground - Granular (MG-G) ■ Glacial Deposits Cohesive (GD-C) ■ Made Ground - Cohesive (MG-C) ■ Glacial Deposits Granular (GD-G) ■ Topsoil (TOP) ● BH BB004 ■ BH BB005 ▲ BH BB006 ◆ NY91SE23 ⊗ NY91SE24 	<ul style="list-style-type: none"> □ NY91SE25 ● NY91SE26 ■ NY91SE27 ◆ NY91SE28 ▽ NY91SE29 ● NY91SE30 ▲ NY91SE31 ■ NY91SE32 ● NY91SE33 ◆ NY91SE34 ■ NY91SE44/A ▲ NY91SE44/D ▶ BH BB007 ◆ BH BB008 ■ BH BB002 	<ul style="list-style-type: none"> ◆ WS BB002 ▲ TP BB001 ▲ TP BB002 ● TP BB005 ● BH BB003
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ARUP

Job Title
A66 NTP

Figure Title
**Atterberg limits
Section 7.1**

Job No 276821	Figure No S7.1-1
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ARUP_gINT_v10.00.01.07_Made by Jamie Belkin on 18-Nov-21

- | | | |
|------------------------------------|--------------|------------|
| ■ Mudstone (RK-Mdst) | □ NY91SE25 | ⊕ WS BB002 |
| ■ Made Ground - Granular (MG-G) | ● NY91SE26 | △ TP BB001 |
| ■ Glacial Deposits Cohesive (GD-C) | ■ NY91SE27 | ● TP BB002 |
| ■ Made Ground - Cohesive (MG-C) | ◆ NY91SE28 | ⊕ TP BB005 |
| ■ Glacial Deposits Granular (GD-G) | ▽ NY91SE29 | ● BH BB003 |
| ■ Topsoil (TOP) | ● NY91SE30 | |
| ● BH BB004 | ▲ NY91SE31 | |
| ■ BH BB005 | ■ NY91SE32 | |
| ▲ BH BB006 | ● NY91SE33 | |
| ● NY91SE23 | ◆ NY91SE34 | |
| ⊗ NY91SE24 | ■ NY91SE44/A | |
| | ▲ NY91SE44/D | |
| | ▼ BH BB007 | |
| | ⊗ BH BB008 | |
| | ■ BH BB002 | |

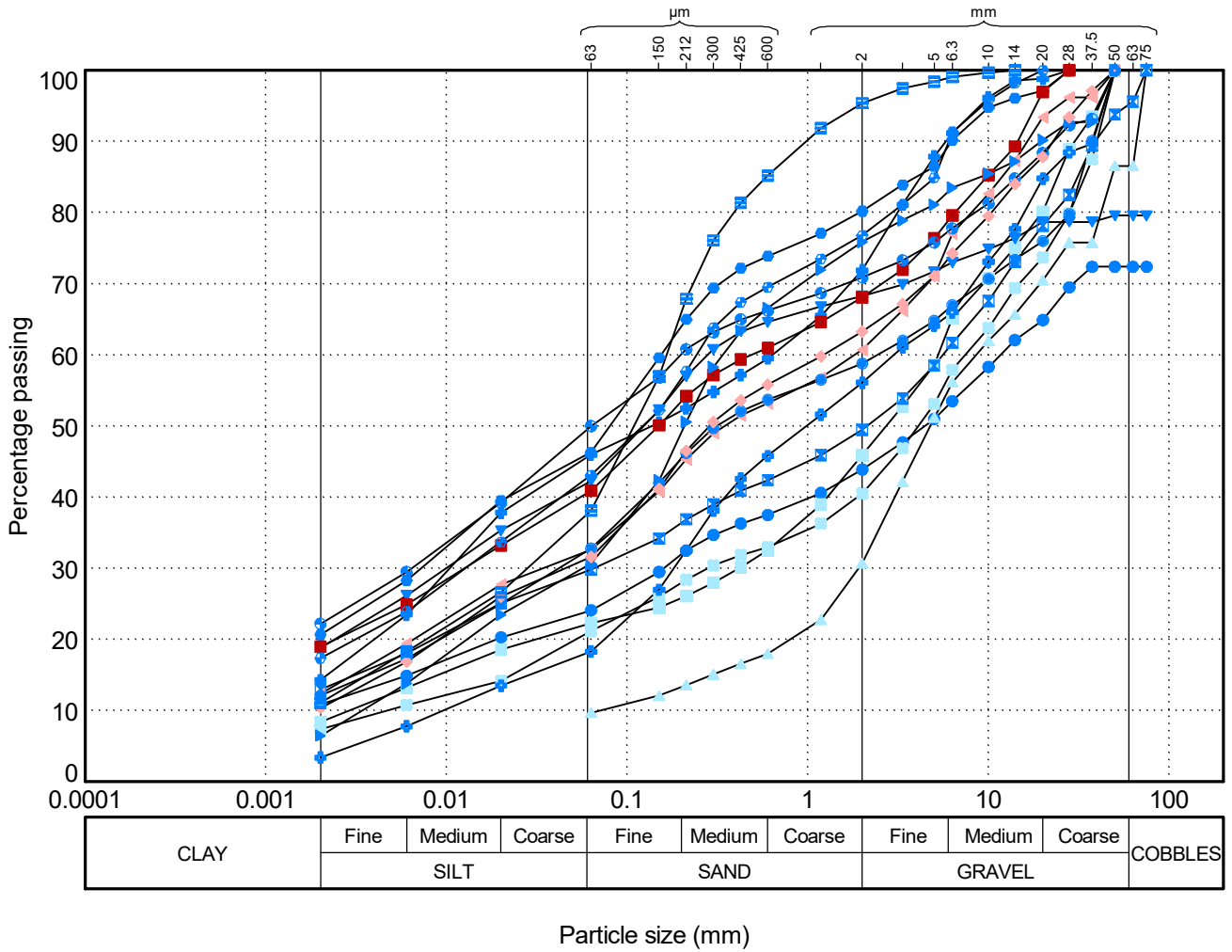
ARUP

Job Title
A66 NTP

Figure Title
**Plasticity chart
Section 7.1**

Job No
276821

Figure No
S7.1-2



- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- BH BB004, 4.00m
- BH BB005, 2.00m
- ▲ BH BB005, 6.00m
- BH BB006, 0.20m
- BH BB007, 2.50m
- ▼ BH BB008, 1.00m
- ⊕ BH BB008, 2.60m
- BH BB002, 0.60m
- ▲ WS BB002, 1.00m
- ▼ TP BB001, 0.40m
- ⊠ TP BB001, 2.50m
- TP BB002, 0.75m
- ⊕ TP BB002, 3.50m
- ◆ TP BB005, 0.50m
- TP BB005, 2.00m
- ⊕ BH BB003, 0.40m
- ⊕ BH BB003, 2.10m

ARUP

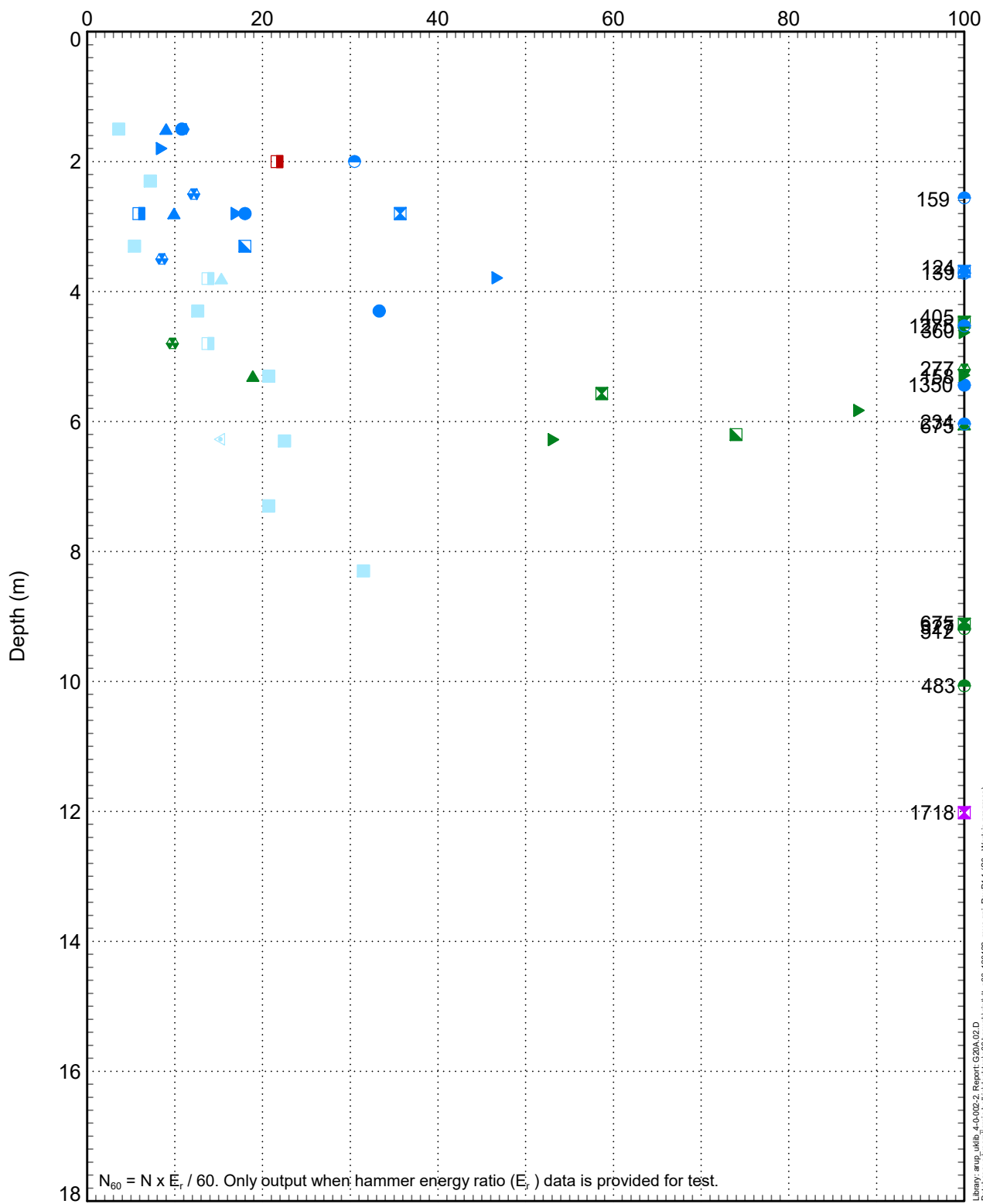
Job Title
A66 NTP

Figure Title
**Particle size distribution
Section 7.1**

Job No
276821

Figure No
S7.1-3

SPT N(60) value, N_{60}



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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 8-Feb-22

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- BH BB004
- BH BB005
- ▲ BH BB006
- NY91SE44/A
- ▲ NY91SE44/D
- ▼ BH BB007
- BH BB008
- BH BB002
- WS BB002
- BH BB003

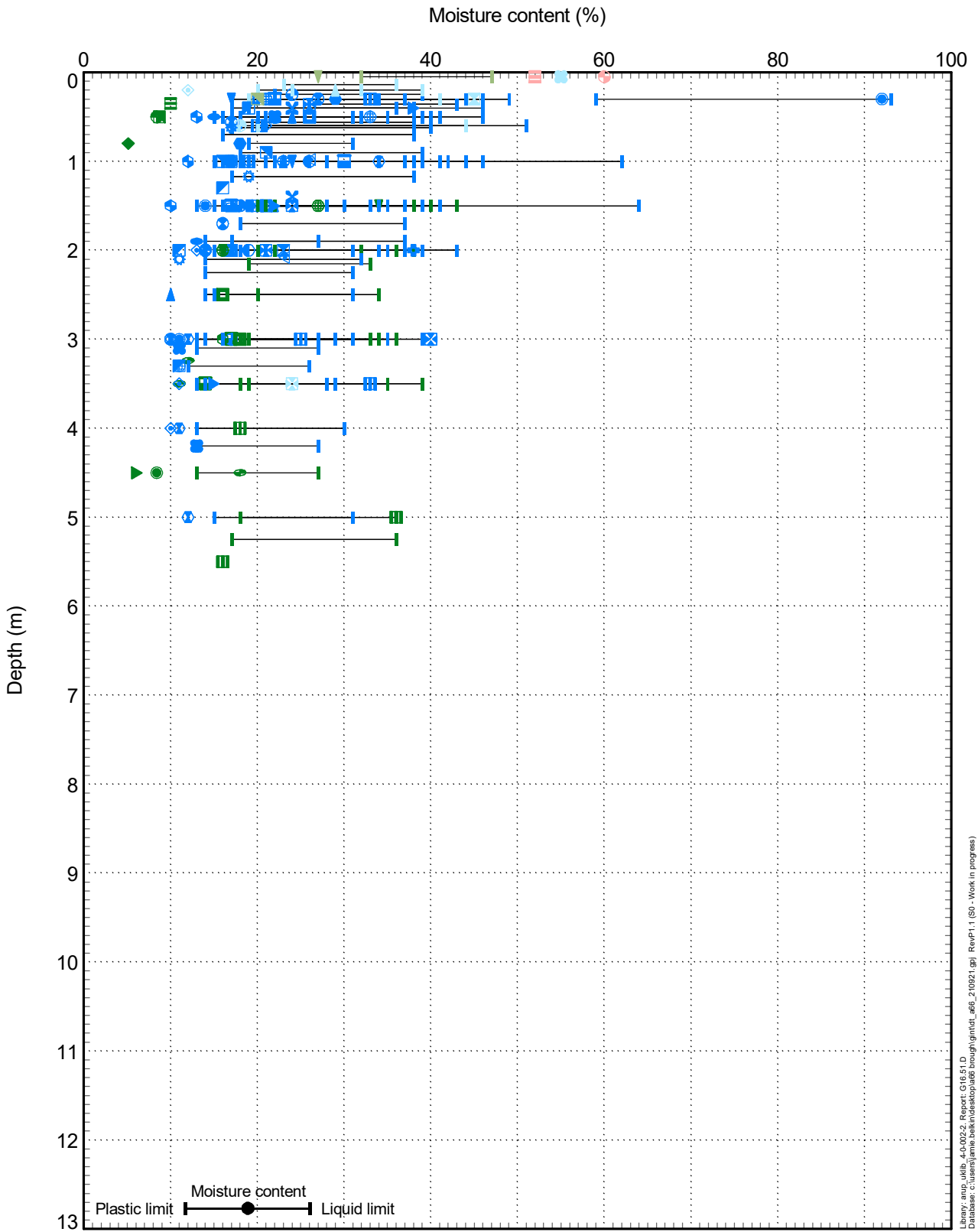
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Job Title
A66 NTP

Figure Title
**Standard penetration tests
Section 7.1**

Job No
276821

Figure No
S7.1-4



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ARUP_gINT_v10.00.01.07_Made by Jamie Belkin on 18-Nov-21

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> ■ Mudstone (RK-Mdst) ■ Made Ground - Granular (MG-G) ■ Glacial Deposits Cohesive (GD-C) ■ Glacial Deposits Granular (GD-G) ■ Topsoil (TOP) ● BH BB013 ● BH BB015 ● NY91SE10 ▲ NY91SE14 ■ NY91SE15 ● NY91SE16 ■ NY91SE17 | <ul style="list-style-type: none"> ● NY91SE18 ■ NY91SE19 ◇ NY91SE20 ● NY91SE21 ■ NY91SE22 ● NY91SE23 ■ NY91SE24 ◇ NY91SE44/C ● NY91SE5 ● NY91SE6 ■ NY91SE7 ● NY91SE8 ▲ BH BB007 ● BH BB008 ● BH BB009 | <ul style="list-style-type: none"> ● BH BB010 ■ BH BB011 ■ BH BB012 ■ BH BB014 ▲ TP BB001 ● TP BB002 ▼ TP BB003 ■ TP BB004 ● TP BB006 ● TP BB007 ■ HDP BB001 |
|--|--|---|

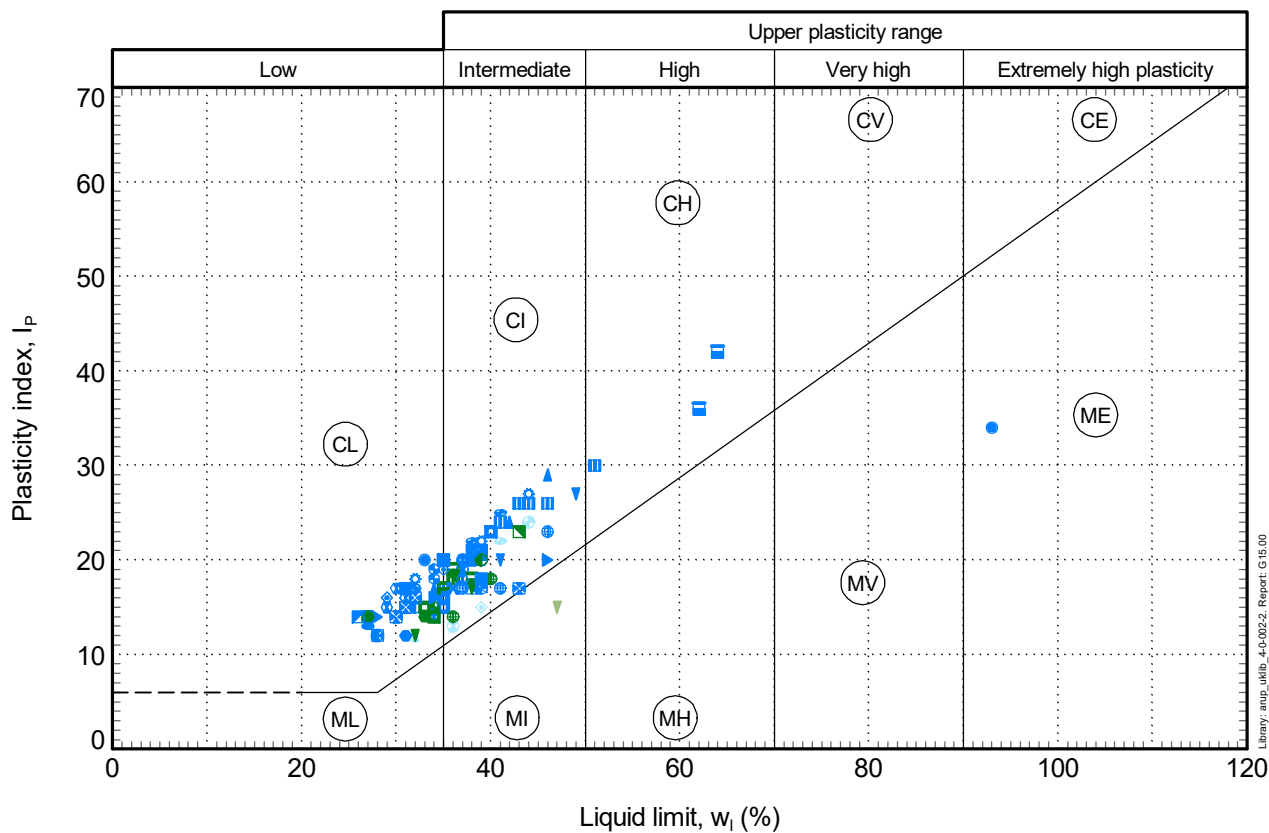
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Job Title
A66 NTP

Figure Title
**Atterberg limits
Section 7.2**

Job No
276821

Figure No
S7.2-1



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- | | | |
|------------------------------------|--------------|------------|
| ■ Mudstone (RK-Mdst) | ● NY91SE18 | ⊕ BH BB014 |
| ■ Made Ground - Granular (MG-G) | ▣ NY91SE19 | △ TP BB001 |
| ■ Glacial Deposits Cohesive (GD-C) | ◇ NY91SE20 | ● TP BB002 |
| ■ Glacial Deposits Granular (GD-G) | ● NY91SE21 | ▼ TP BB003 |
| ■ Topsoil (TOP) | ■ NY91SE22 | ■ TP BB004 |
| ● BH BB013 | ⊗ NY91SE23 | ● TP BB006 |
| ● BH BB015 | ⊗ NY91SE24 | ⊗ TP BB007 |
| ● NY91SE10 | ⊗ NY91SE44/C | |
| ▲ NY91SE14 | ⊗ NY91SE5 | |
| ▣ NY91SE15 | ▼ NY91SE6 | |
| ● NY91SE16 | ▣ NY91SE7 | |
| ■ NY91SE17 | ⊗ NY91SE8 | |
| | ▲ BH BB007 | |
| | ▣ BH BB008 | |
| | ● BH BB009 | |

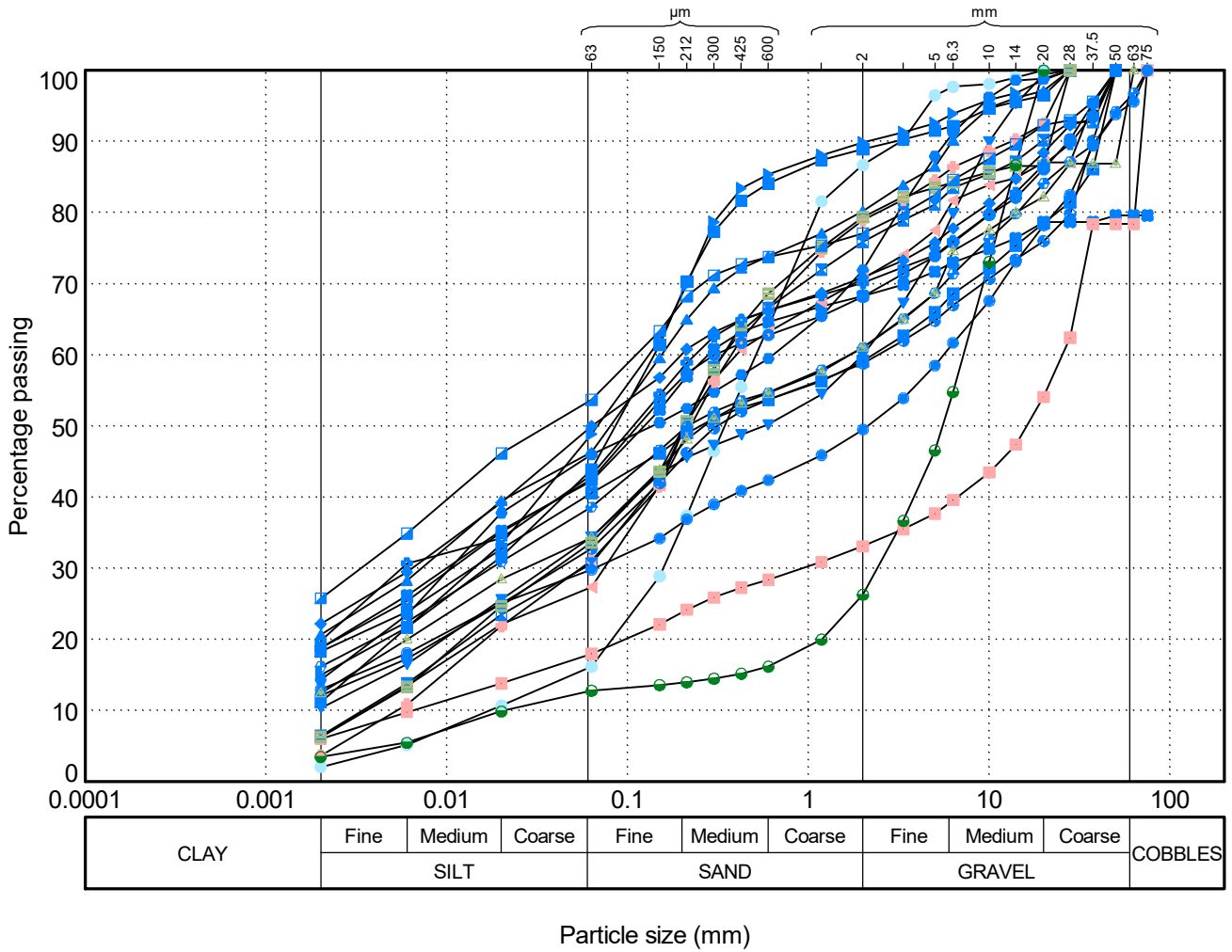
ARUP

Job Title
A66 NTP

Figure Title
Plasticity chart
Section 7.2

Job No
276821

Figure No
S7.2-2



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- | | |
|------------------------------------|--------------------|
| ■ Mudstone (RK-Mdst) | ■ BH BB011, 0.40m |
| ■ Made Ground - Granular (MG-G) | ▲ BH BB012, 0.05m |
| ■ Glacial Deposits Cohesive (GD-C) | ▲ BH BB014, 0.30m |
| ■ Glacial Deposits Granular (GD-G) | ⊠ TP BB001, 0.40m |
| ■ Topsoil (TOP) | ● TP BB001, 2.50m |
| ● BH BB013, 0.05m | ⊕ TP BB002, 0.75m |
| ■ BH BB015, 0.20m | ◆ TP BB002, 3.50m |
| ▲ BH BB007, 2.50m | ▨ TP BB003, 0.20m |
| ■ BH BB008, 1.00m | ⊕ TP BB004, 0.50m |
| ● BH BB008, 2.60m | ⊕ TP BB004, 3.50m |
| ● BH BB009, 3.50m | ⊕ TP BB006, 1.20m |
| ⊕ BH BB010, 0.05m | ⊕ TP BB006, 2.20m |
| | ▨ TP BB007, 1.80m |
| | ● TP BB007, 3.00m |
| | ▲ HDP BB001, 0.30m |

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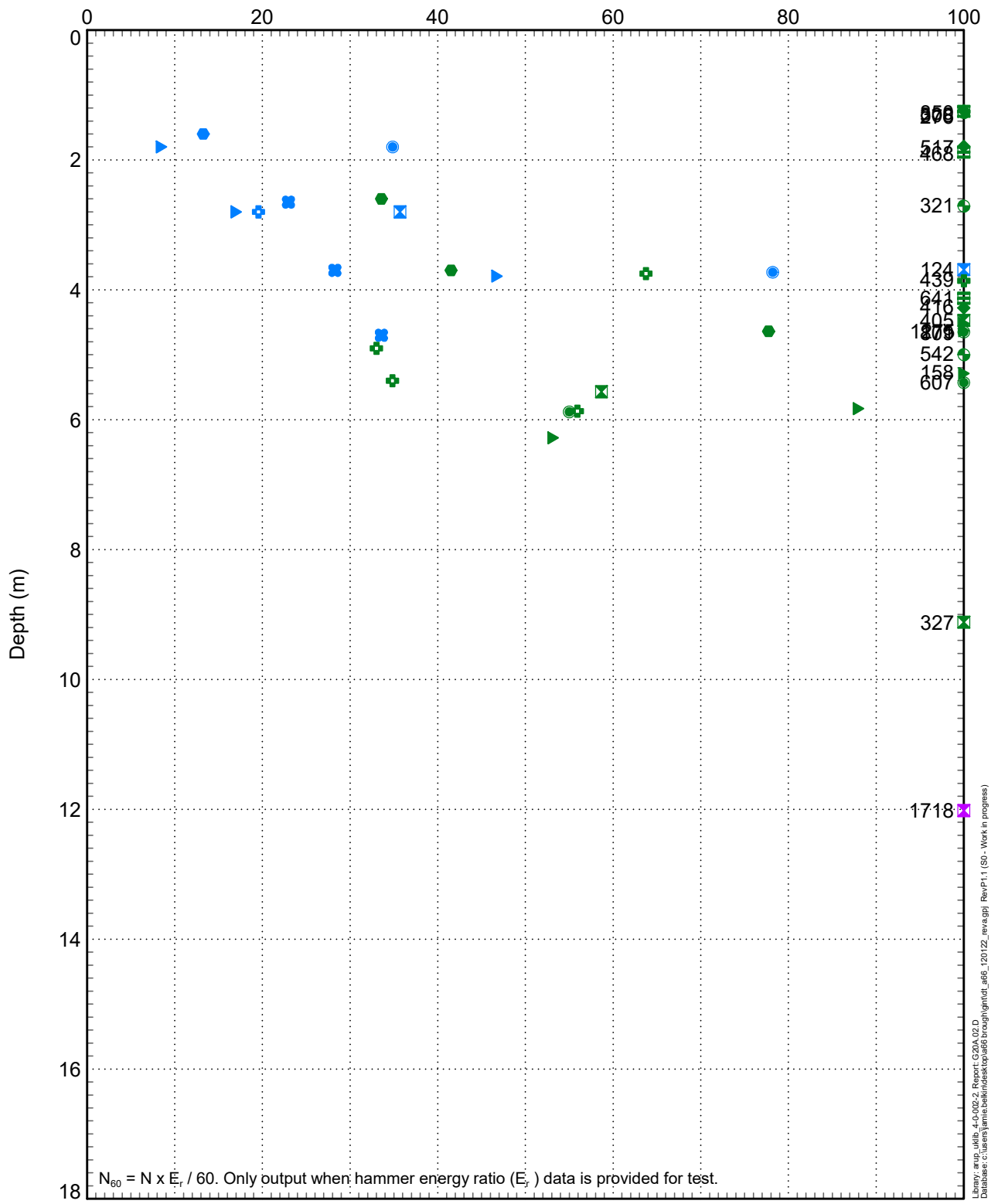
Job Title
A66 NTP

Figure Title
**Particle size distribution
Section 7.2**

Job No
276821

Figure No
S7.2-3

SPT N(60) value, N_{60}



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- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- BH BB013
- BH BB015
- ▼ BH BB007
- ⊠ BH BB008
- BH BB009
- BH BB010
- ◆ BH BB011
- ▨ BH BB012
- ⊕ BH BB014

ARUP

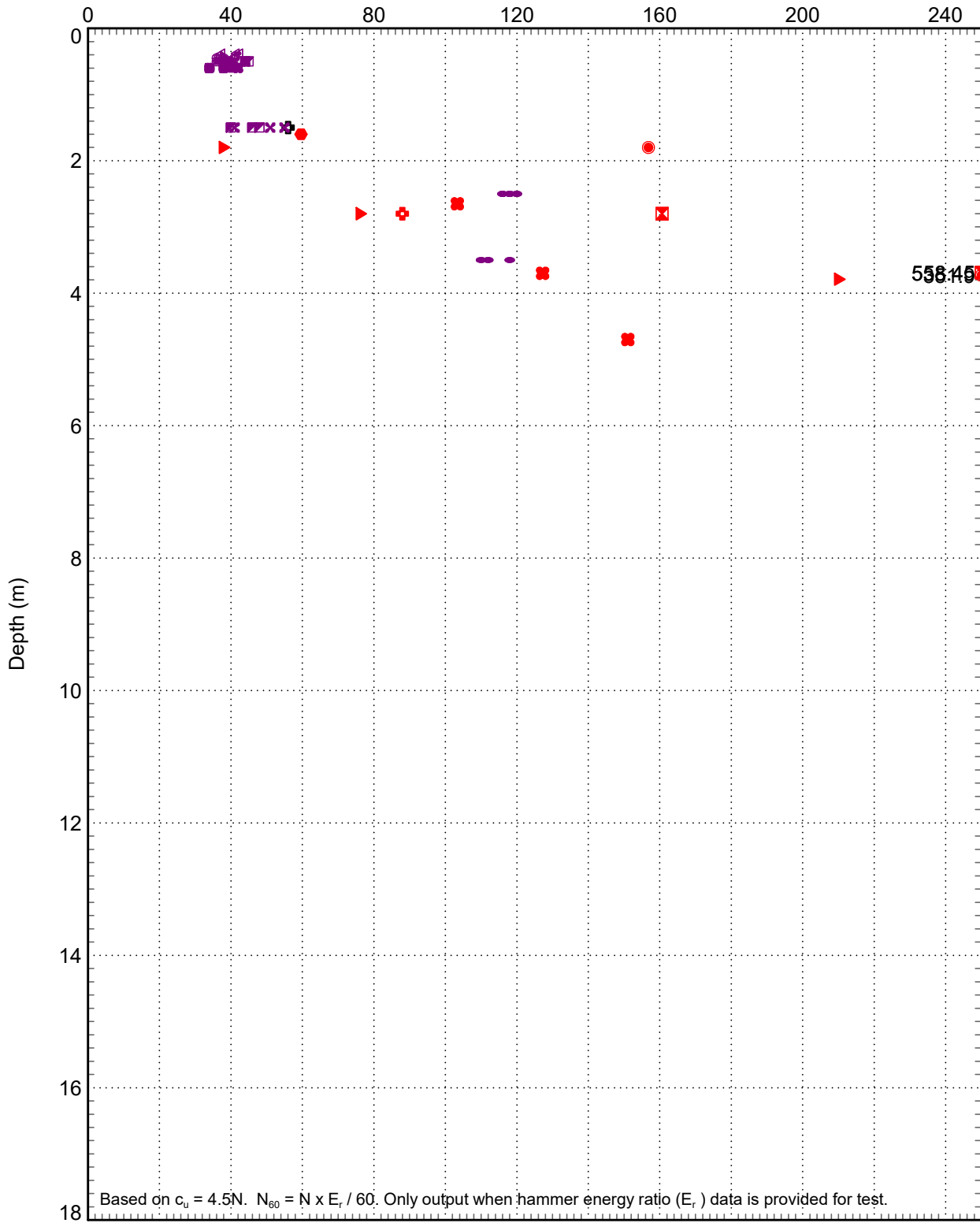
Job Title
A66 NTP

Figure Title
Standard penetration tests
Section 7.2

Job No
276821

Figure No
S7.2-4

Undrained shear strength, c_u (kPa)



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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 22-Feb-22

- c_u from SPT (x4.5)
- From hand vane (peak)
- From triaxial test
- BH BB013
- BH BB015
- ▼ BH BB007
- BH BB008
- BH BB009
- BH BB014
- ▲ TP BB001
- TP BB002
- TP BB004
- TP BB006
- × TP BB007

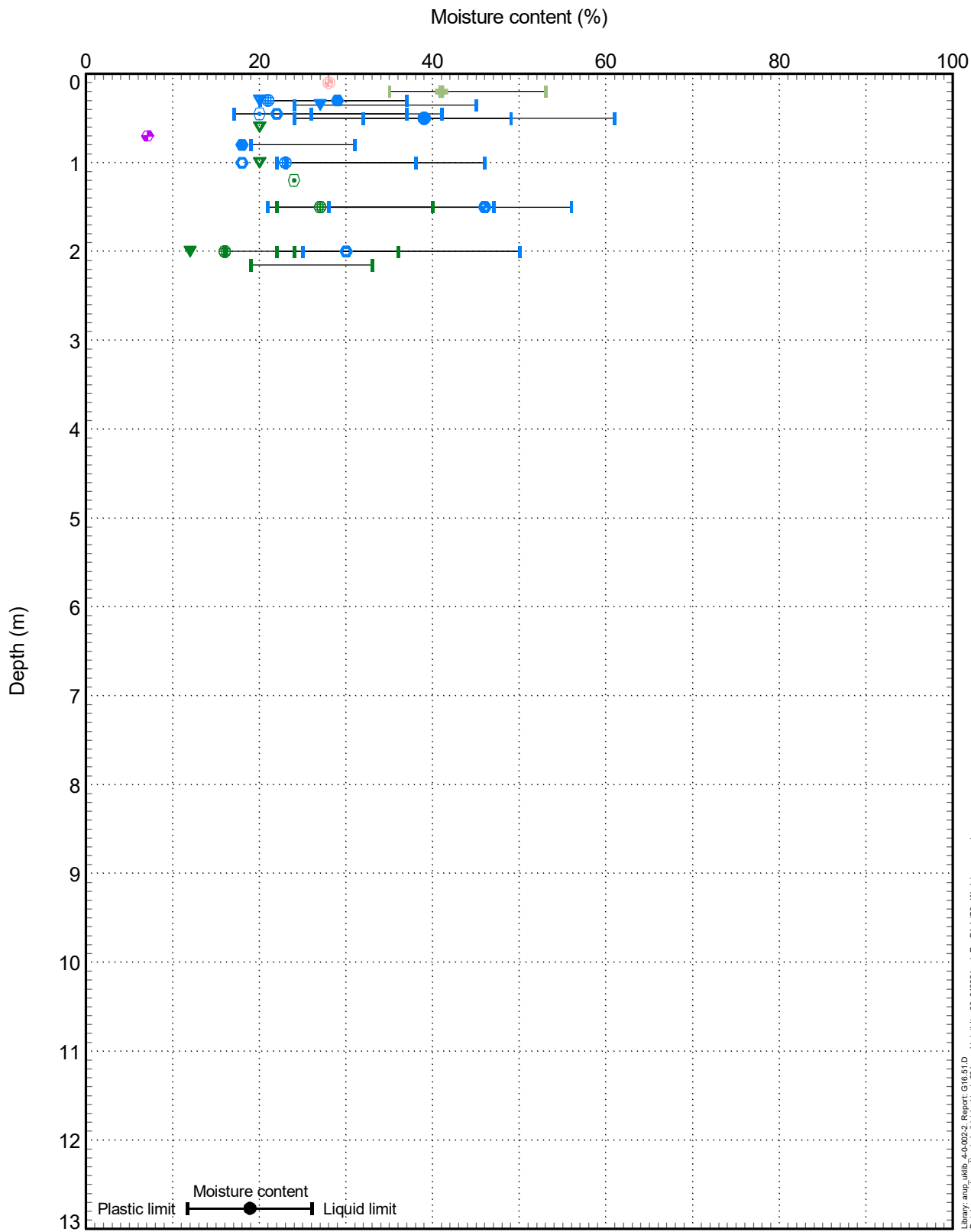
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Job Title
A66 NTP

Figure Title
Undrained shear strength
Section 7.2

Job No
276821

Figure No
S7.2-5



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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- BH BB015
- ▼ BH BB016
- ⊕ BH BB017
- ⊗ NY91SE5
- NZ01SW14
- ⊕ NZ01SW15
- ▼ NZ01SW16
- ⊕ BH BB018
- TP BB008
- ⊗ TP BB009

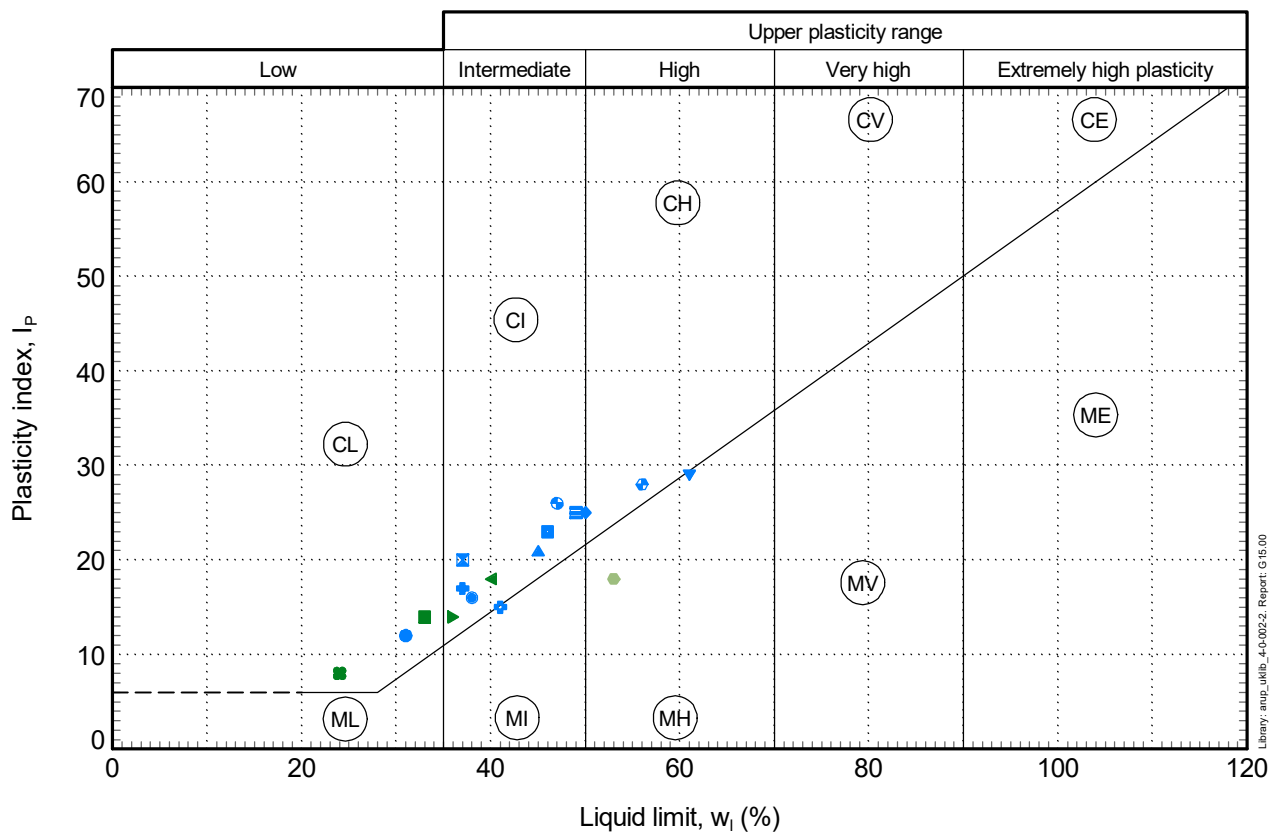
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Job Title
A66 NTP

Figure Title
**Atterberg limits
 Section 7.3**

Job No
276821

Figure No
S7.3-1



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- | | |
|------------------------------------|-------------------|
| ■ Mudstone (RK-Mdst) | ● NZ01SW14, 1.00m |
| ■ Glacial Deposits Cohesive (GD-C) | ● NZ01SW14, 1.50m |
| ■ Topsoil (TOP) | ● NZ01SW14, 2.00m |
| ● BH BB015, 0.80m | ■ NZ01SW15, 0.50m |
| ● BH BB015, 2.15m | ⊕ TP BB008, 0.45m |
| ▲ BH BB016, 0.35m | ⊕ TP BB009, 1.50m |
| ● BH BB016, 2.00m | |
| ● BH BB017, 0.20m | |
| ▼ BH BB017, 0.50m | |
| ⊕ NY91SE5, 0.30m | |
| ■ NY91SE5, 1.00m | |
| ▲ NY91SE5, 1.50m | |
| ▼ NY91SE5, 2.00m | |
| ⊗ NZ01SW14, 0.45m | |

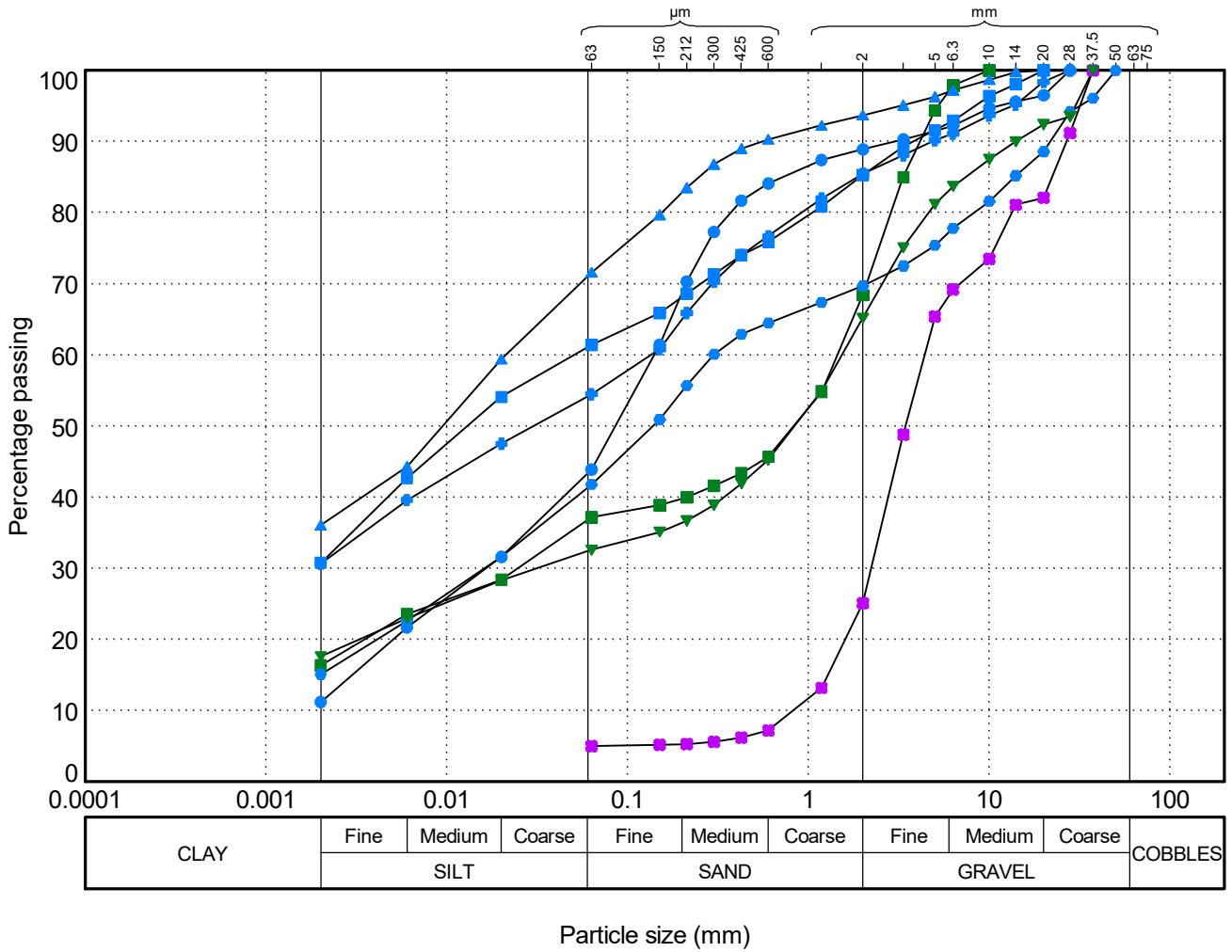
ARUP

Job Title
A66 NTP

Figure Title
**Plasticity chart
Section 7.3**

Job No
276821

Figure No
S7.3-2



- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- BH BB015, 0.20m
- BH BB016, 1.30m
- ▲ BH BB017, 0.50m
- BH BB018, 0.70m
- TP BB008, 0.80m
- ▼ TP BB008, 1.40m
- TP BB009, 0.80m
- TP BB009, 1.80m

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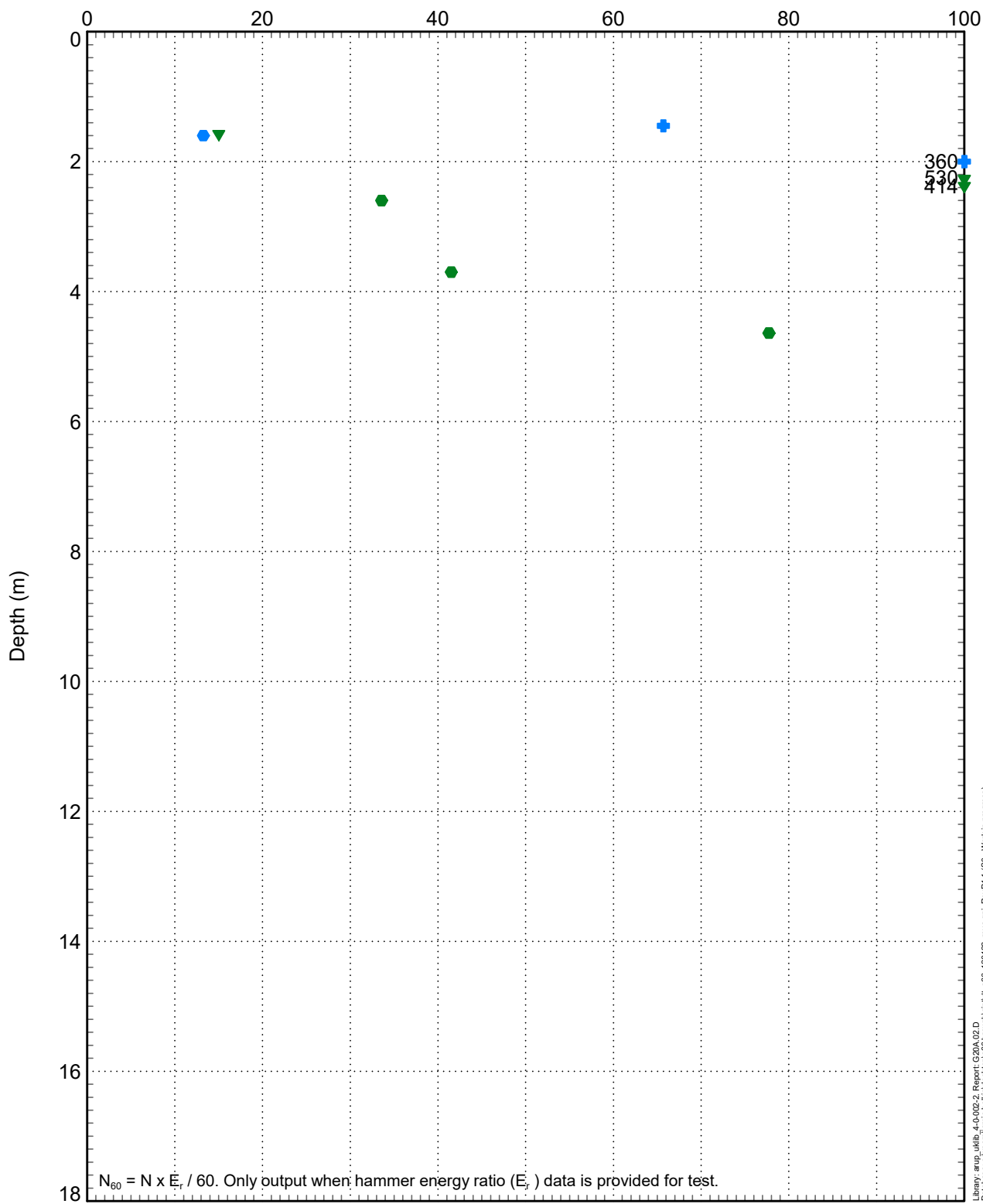
Job Title
A66 NTP

Figure Title
Particle size distribution
Section 7.3

Job No
276821

Figure No
S7.3-3

SPT N(60) value, N_{60}



$N_{60} = N \times E_r / 60$. Only output when hammer energy ratio (E_r) data is provided for test.

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- Mudstone (RK-Mdst)
- Glacial Deposits Cohesive (GD-C)
- BH BB015
- ▼ BH BB016
- ⊕ BH BH017

ARUP

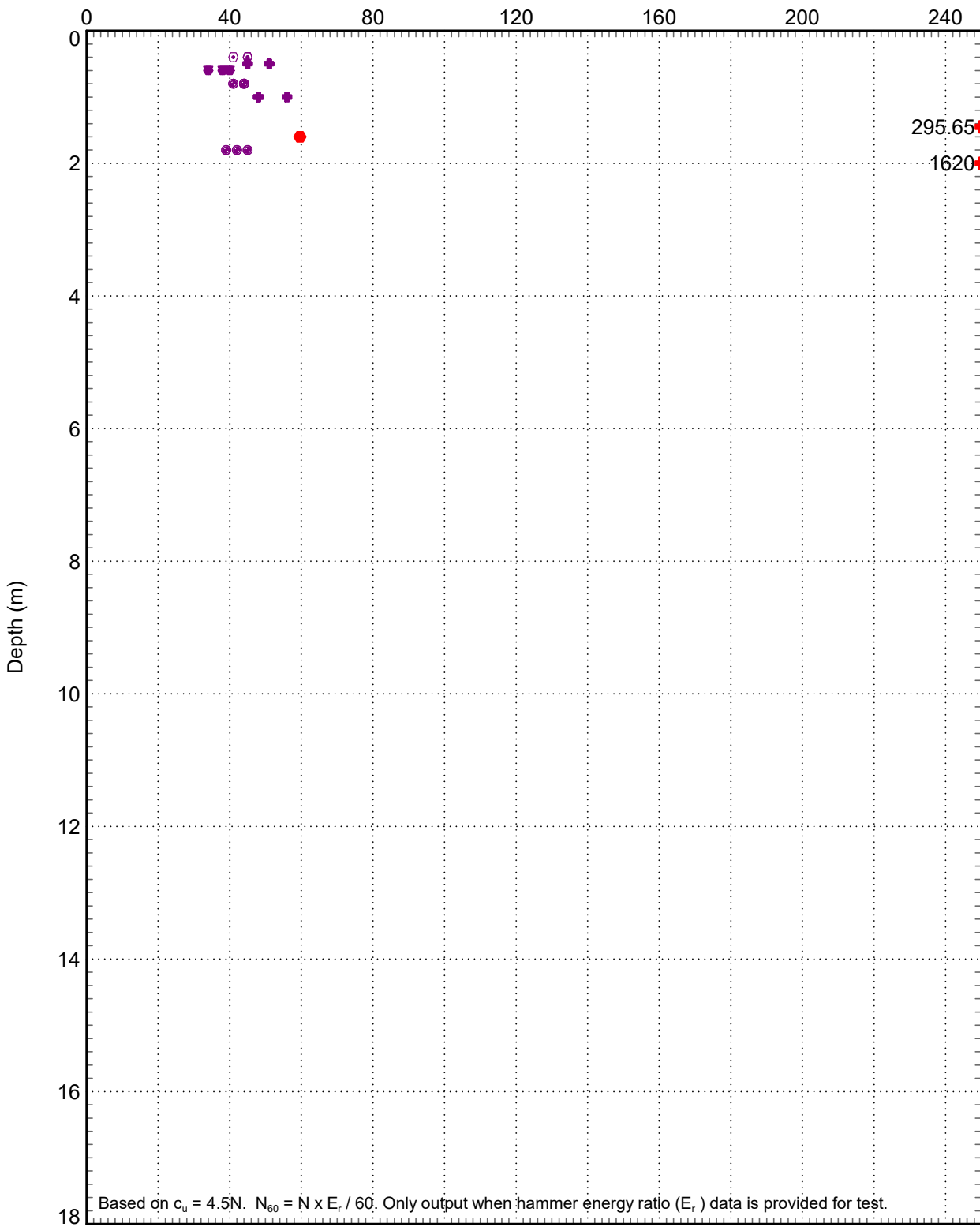
Job Title
A66 NTP

Figure Title
Standard penetration tests
Section 7.3

Job No
276821

Figure No
S7.3-4

Undrained shear strength, c_u (kPa)



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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 22-Feb-22

- c_u from SPT (x4.5)
- From hand vane (peak)
- From triaxial test
- BH BB015
- ▼ BH BB016
- ⊕ BH BB017
- ⊙ TP BB008
- ⊙ TP BB009

ARUP

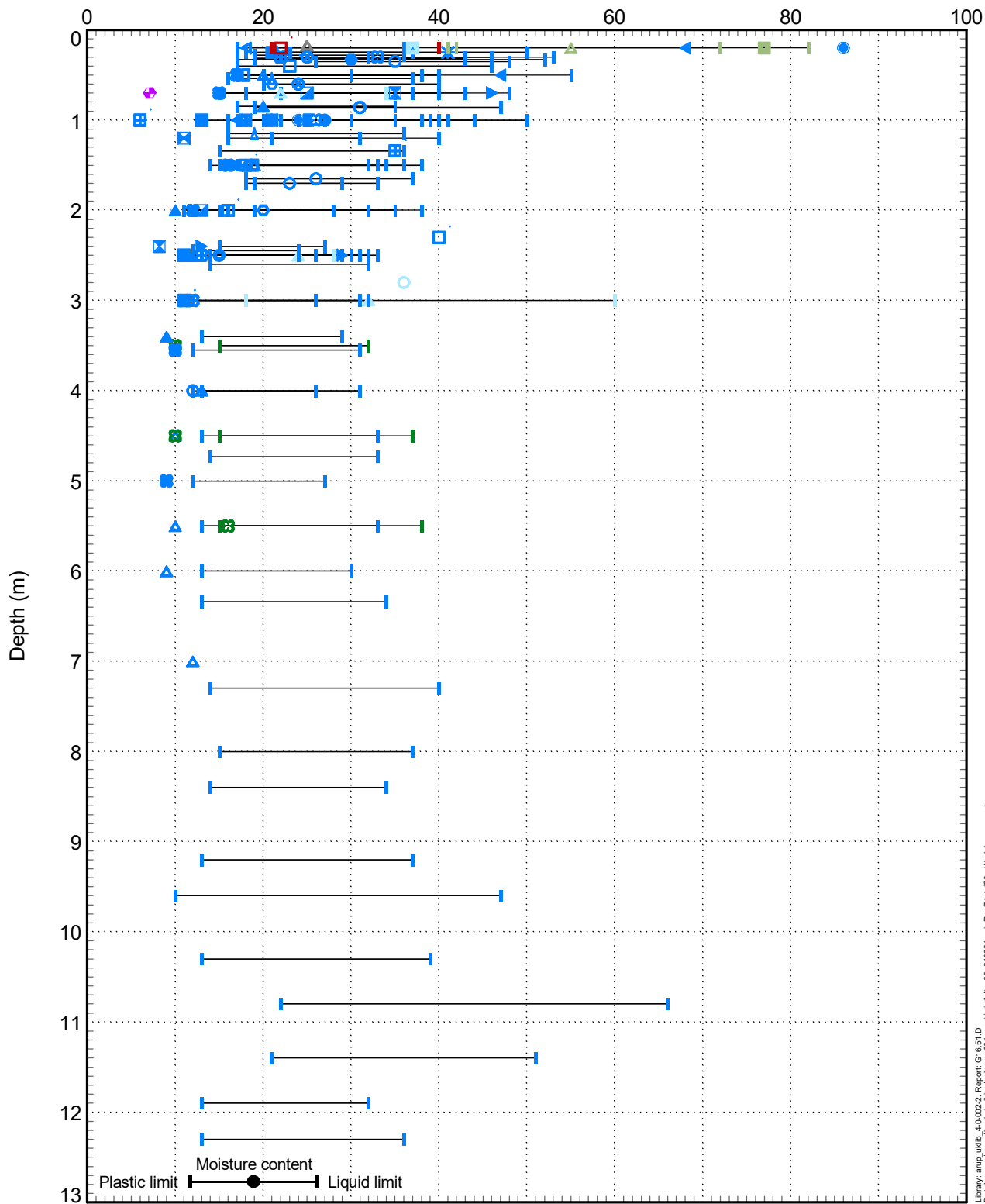
Job Title
A66 NTP

Figure Title
Undrained shear strength
Section 7.3

Job No
276821

Figure No
S7.3-5

Moisture content (%)



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Database: c:\users\jamie.belkin\desktop\at66_210921.gpr RevP1.1 (S0 - Work in progress)

ARUP_gINT_v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> ■ Mudstone (RK-Mdst) ■ Limestone (RK-Lst) ■ Glacial Deposits Cohesive (GD-C) ■ Made Ground - Cohesive (MG-C) ■ Glacial Deposits Granular (GD-G) ■ Topsoil (TOP) ■ BH BB019 ▲ BH BB021 ▼ BH BB022 ⊠ BH BB025 ● BH BB026 ○ NZ01SW10 | <ul style="list-style-type: none"> □ NZ01SW11 ▲ NZ01SW12 ⊠ NZ01SW13 ⊠ NZ01SW17 ⊠ NZ01SW18 ◄ NZ01SW19 □ NZ01SW22 ▲ NZ01SW4 ⊠ NZ01SW5 ■ NZ01SW6 ▲ NZ01SW7 ⊠ NZ01SW8 ● NZ01SW9 ⊠ BH BB018 ⊠ BH BB020 | <ul style="list-style-type: none"> ● BH BB023 ⊠ BH BB024 ⊠ WS BB001 ○ TP BB010 □ TP BB011 ▲ TP BB012 ⊠ TP BB013 ○ TP BB014 |
|--|--|--|

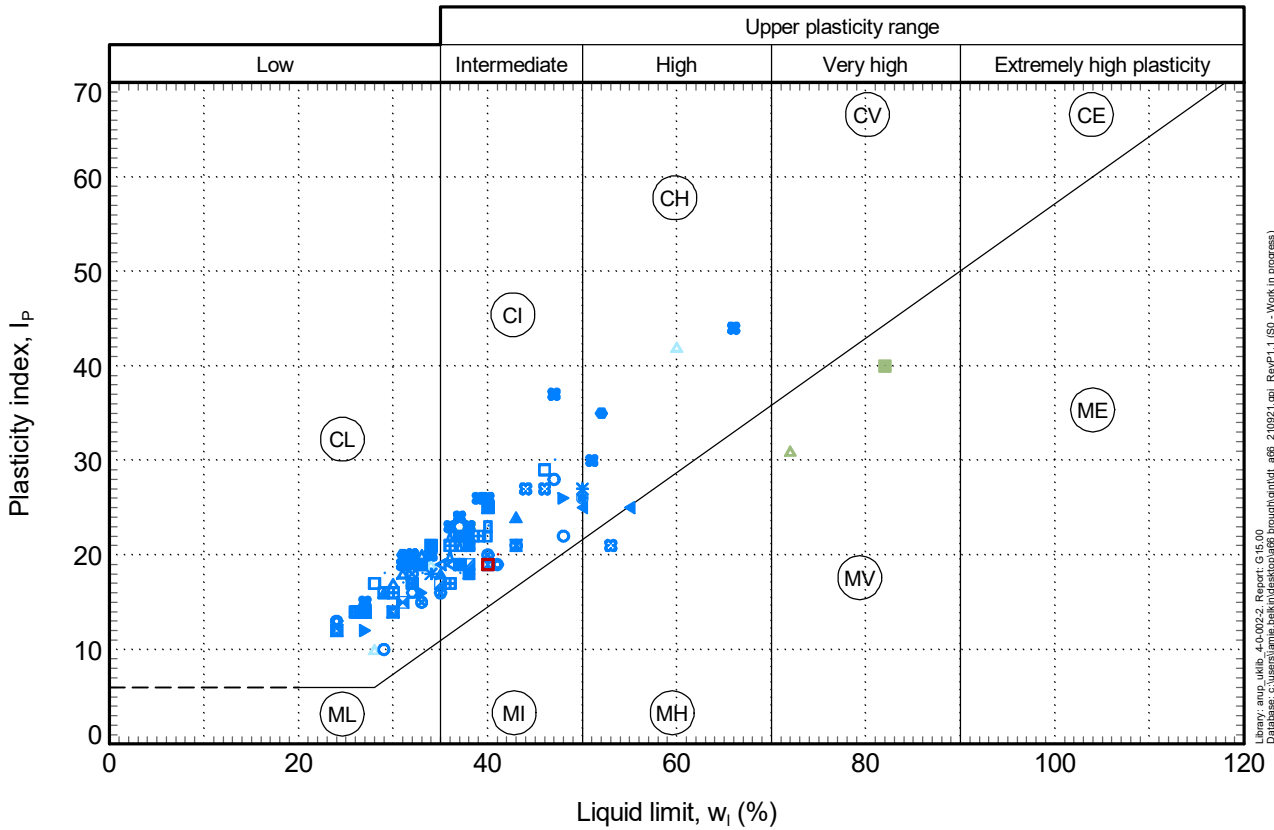
ARUP

Job Title
A66 NTP

Figure Title
Atterberg limits
Section 7.4

Job No
276821

Figure No
S7.4-1



Library path: \\fs1\4.0.002.0_R\Project_016100 Database: c:\users\janna.beekin\desktop\A66 through\mid_a66_210921.gpi RevP1.1 (SO - Work in progress)

ARUP_gINT_v10.00.01.07, Made by Jannie Belkin on 18-Nov-21

- | | | |
|------------------------------------|------------|------------|
| ■ Mudstone (RK-Mdst) | ▲ NZ01SW12 | ⊠ WS BB001 |
| ■ Glacial Deposits Cohesive (GD-C) | ⊠ NZ01SW13 | ○ TP BB010 |
| ■ Made Ground - Cohesive (MG-C) | ⊠ NZ01SW17 | □ TP BB011 |
| ■ Glacial Deposits Granular (GD-G) | ⊠ NZ01SW18 | ▲ TP BB012 |
| ■ Topsoil (TOP) | ⊠ NZ01SW19 | ⊠ TP BB013 |
| ■ BH BB019 | ⊠ NZ01SW22 | ○ TP BB014 |
| ■ BH BB021 | ▲ NZ01SW4 | |
| ■ BH BB022 | ⊠ NZ01SW5 | |
| ■ BH BB025 | ■ NZ01SW6 | |
| ■ BH BB026 | ▲ NZ01SW7 | |
| ○ NZ01SW10 | ⊠ NZ01SW8 | |
| □ NZ01SW11 | ● NZ01SW9 | |
| | ⊠ BH BB020 | |
| | ○ BH BB023 | |
| | ■ BH BB024 | |

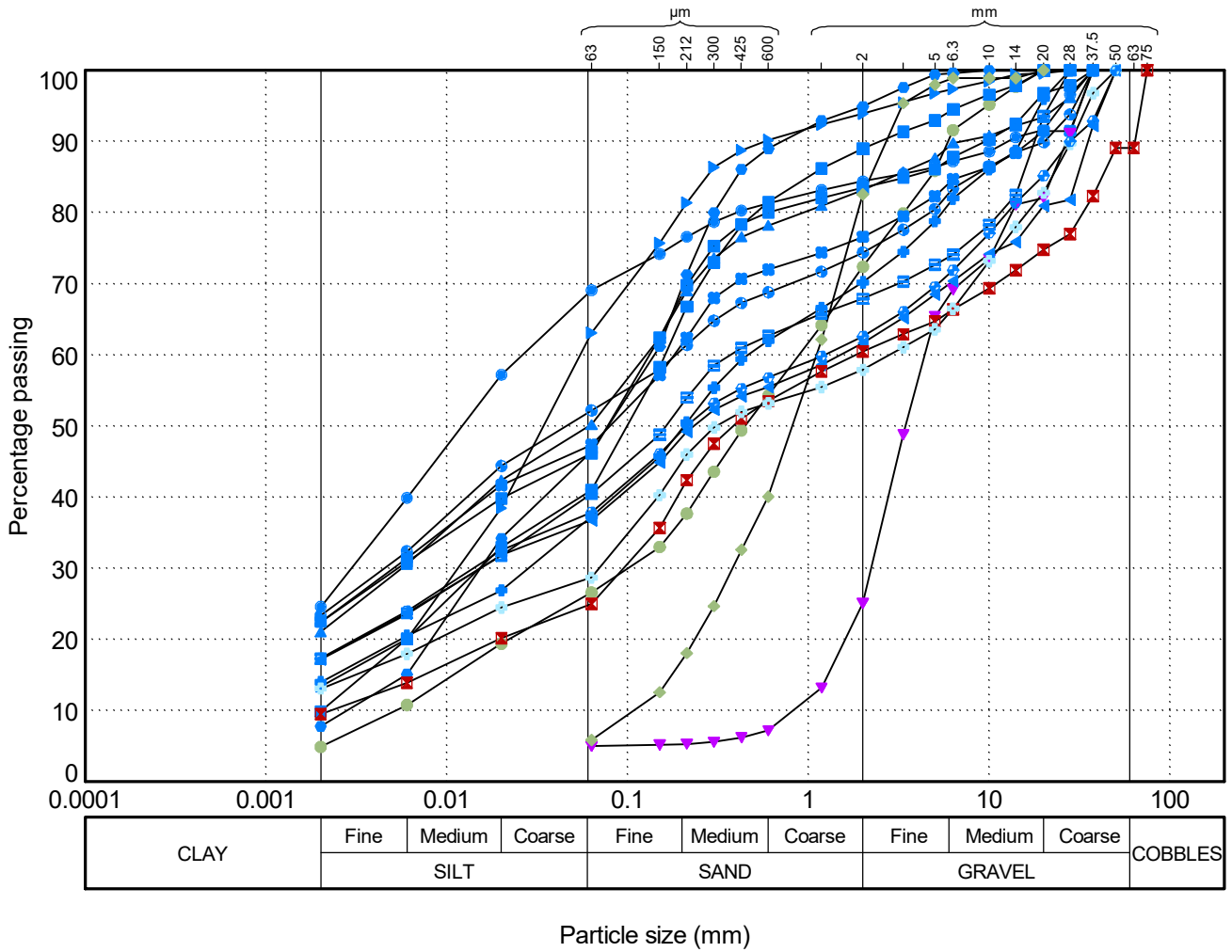
ARUP

Job Title
A66 NTP

Figure Title
Plasticity chart
Section 7.4

Job No
276821

Figure No
S7.4-2



Library: arup_wdr_4-0-002-2 Report: G:\QA-QC Database: C:\users\jama.beikindoktopag8\brought\mtd_a66_210521.gpr Rev\F1.1 (S0 - Work in progress)

1,00

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)
- Unknown
- BH BB019, 0.20m
- BH BB021, 0.20m
- ▲ BH BB022, 0.60m
- BH BB025, 0.60m
- BH BB026, 0.00m
- ▼ BH BB018, 0.70m
- BH BB020, 1.20m
- BH BB023, 1.00m
- ▲ BH BB024, 1.50m
- ▼ TP BB010, 2.00m
- TP BB011, 0.70m
- TP BB011, 2.70m
- TP BB012, 0.80m
- ◆ TP BB013, 0.10m
- TP BB013, 0.55m
- TP BB014, 1.70m
- TP BB014, 2.20m

ARUP

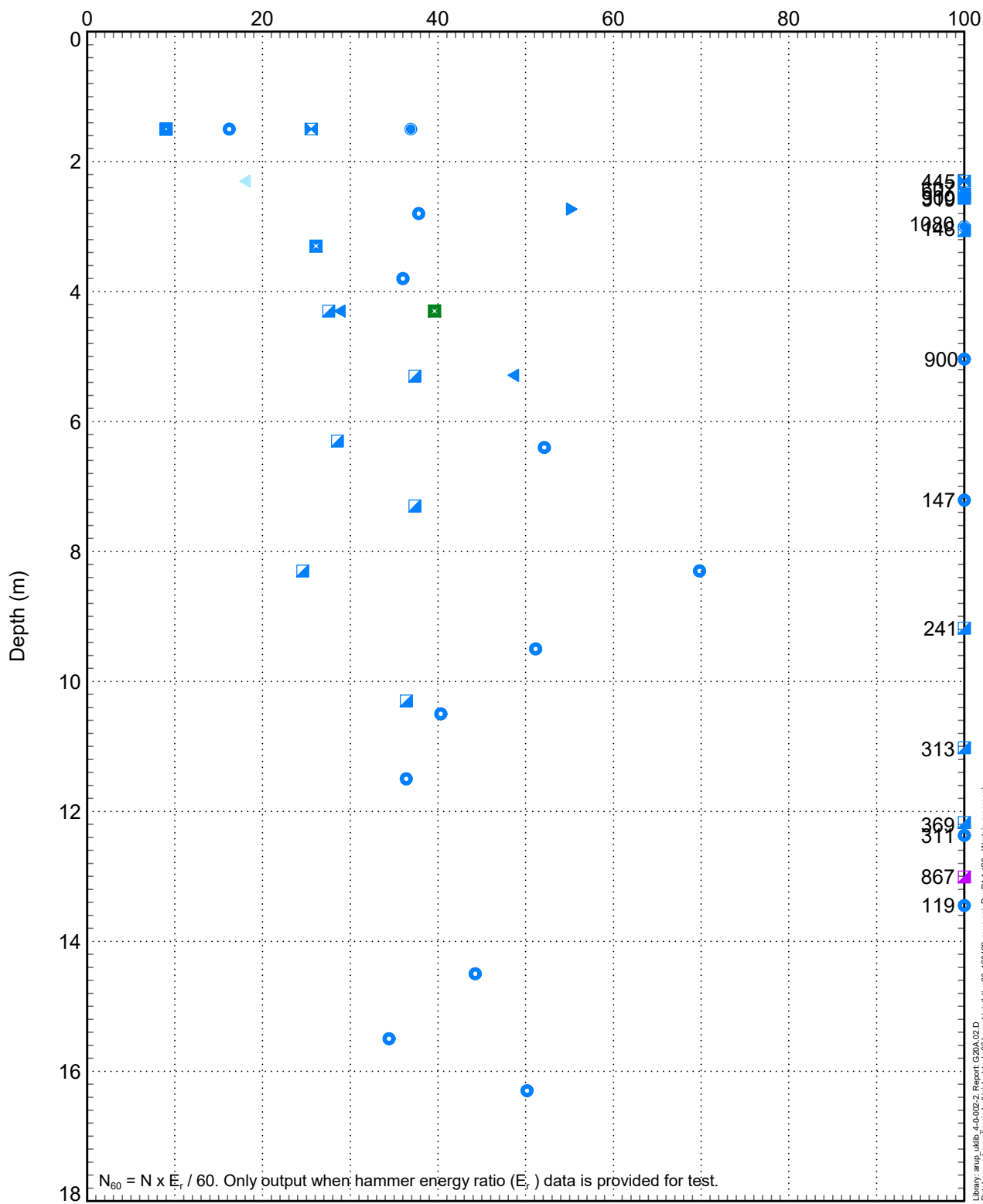
Job Title
A66 NTP

Figure Title
**Particle size distribution
Section 7.4**

Job No
276821

Figure No
S7.4-3

SPT N(60) value, N_{60}



- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB019
- ▲ BH BB021
- ▼ BH BB022
- ⊠ BH BB025
- BH BB026
- ⊠ BH BB020
- BH BB023
- BH BB024
- ⊠ WS BB001

ARUP

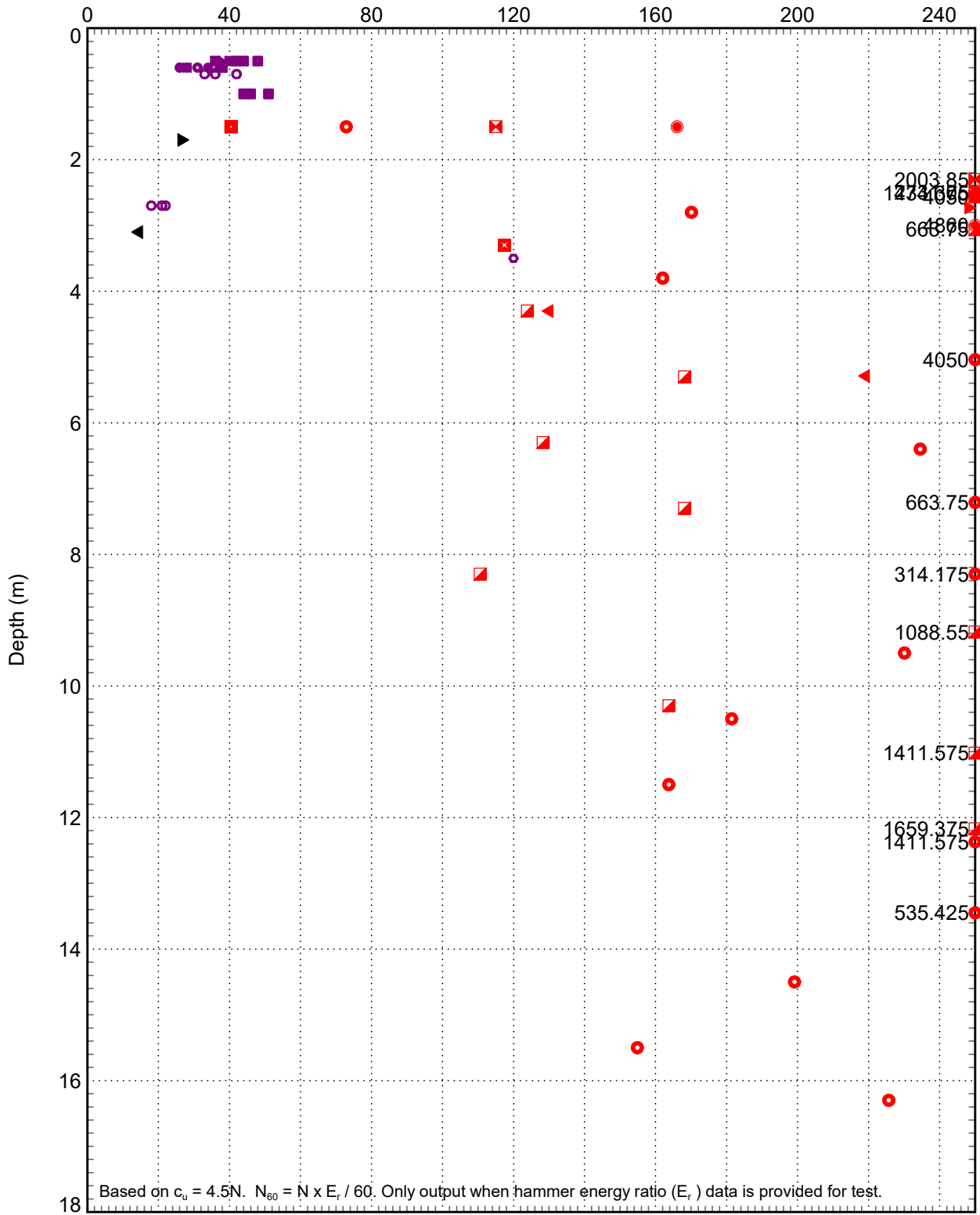
Job Title
A66 NTP

Figure Title
**Standard penetration tests
Section 7.4**

Job No
276821

Figure No
S7.4-4

Undrained shear strength, c_u (kPa)



\\nasr-arup\utilb_44\2023-01_Renort_C31_20x12\01_D... Database: c:\base\jamie.belkin\desktop\666\666\fig\mkt_a66_120122_rev.aopli Rev:P1.1 (SO - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 22-Feb-22

- c_u from SPT (x4.5)
- From hand vane (peak)
- From triaxial test
- BH BB019
- ▲ BH BB021
- ▼ BH BB022
- BH BB025
- BH BB026
- BH BB020
- BH BB023
- BH BB024
- WS BB001
- TP BB010
- TP BB014

ARUP

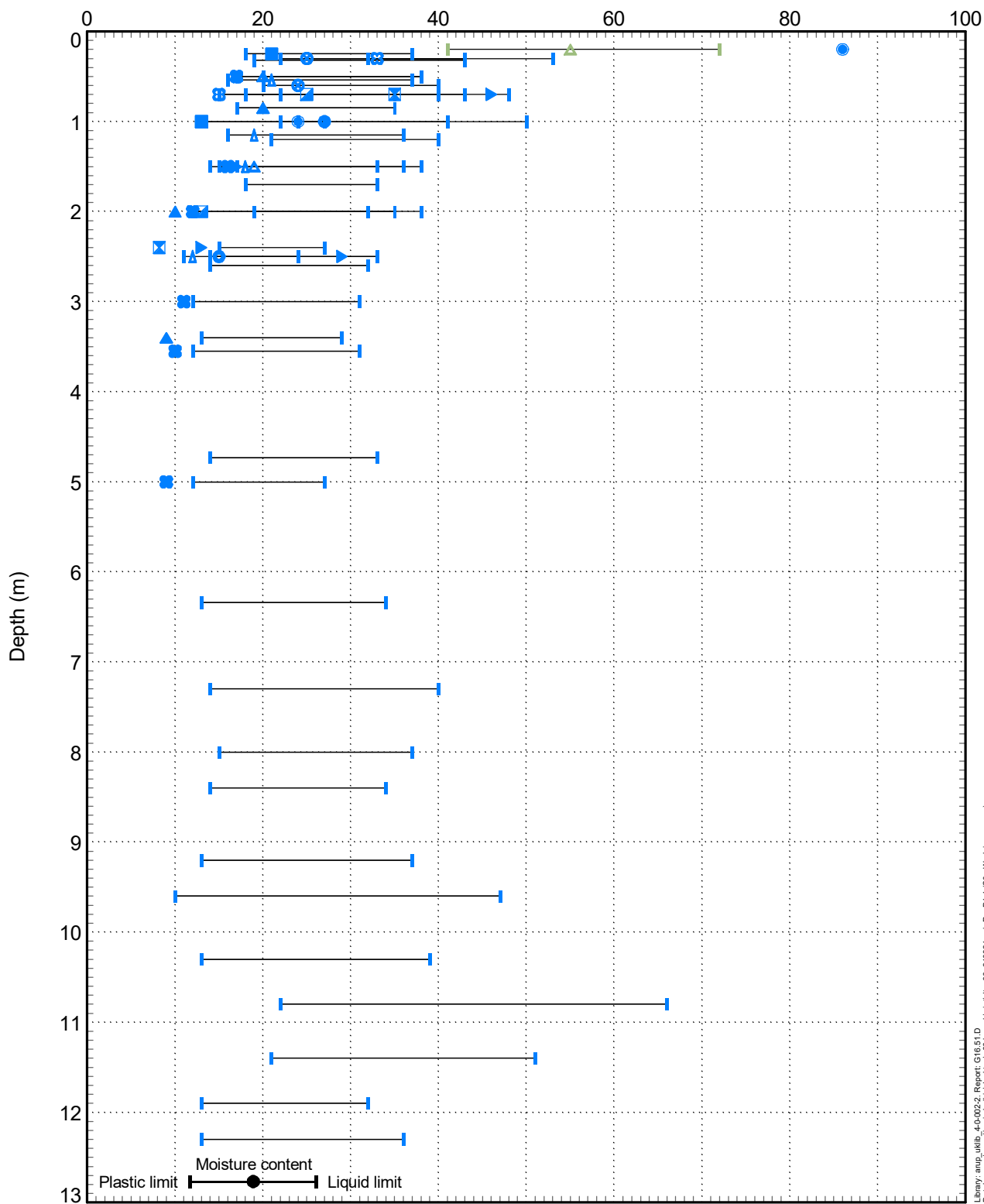
Job Title
A66 NTP

Figure Title
Undrained shear strength
Section 7.4

Job No
276821

Figure No
S7.4-5

Moisture content (%)



Library path: \\fs1-01-002-02-Report-C\6.5\1.D
Database: c:\users\jamie.belkin\desktop\at66 Database at66_210921.gpr RevP1.1 (S0 - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- ▼ BH BB022
- ⊗ BH BB025
- BH BB026
- ▲ NZ01SW4
- ⊗ NZ01SW5
- NZ01SW6
- ▲ NZ01SW7
- ⊗ NZ01SW8
- BH BB023
- ◻ BH BB024
- ▲ TP BB012
- ⊗ TP BB013

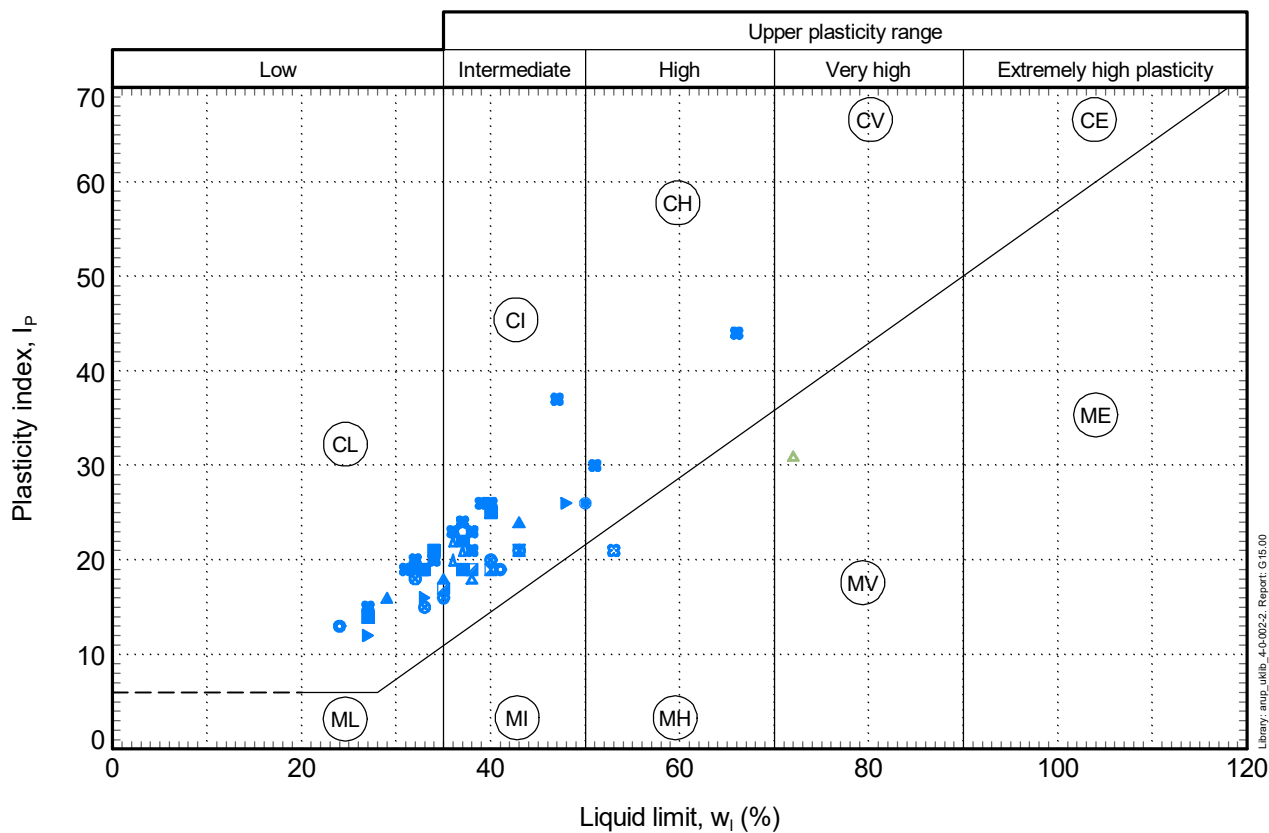
ARUP

Job Title
A66 NTP

Figure Title
Atterberg limits
Section 7.5

Job No
276821

Figure No
S7.5-1



Library: \\ntb\... 4.0.002.0; Report: S15.00
Database: c:\user\jama.beek\indesktop\A66 through\mid...a66_210921.gpi; Rev:P1.1 (SO - Work in progress)

ARUP_gINT_v10.00.01.07; Made by Jamie Belkin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- ▼ BH BB022
- ⊠ BH BB025
- BH BB026
- ▲ NZ01SW4
- ⊗ NZ01SW5
- NZ01SW6
- ▲ NZ01SW7
- NZ01SW8
- BH BB023
- ▲ BH BB024
- ▲ TP BB012
- ⊠ TP BB013

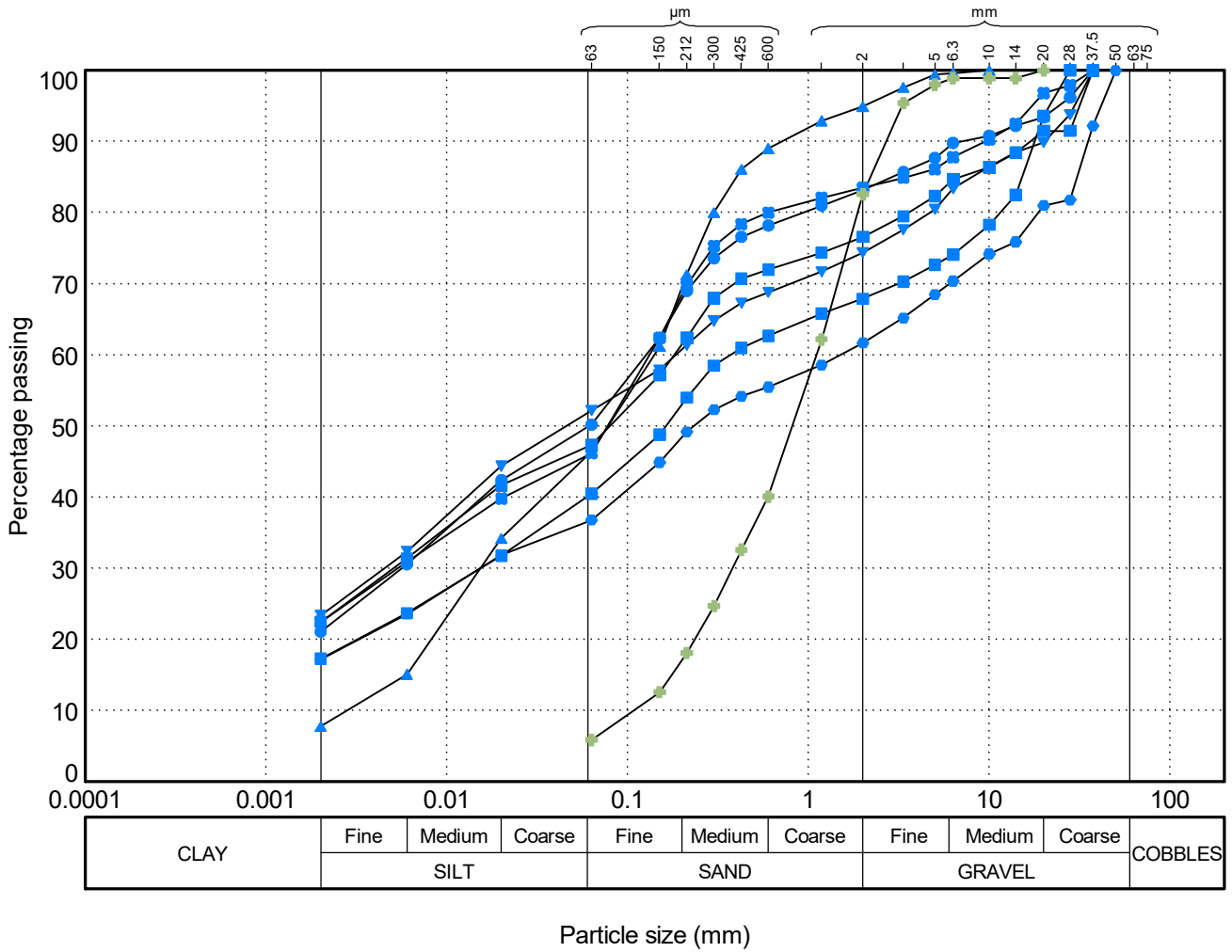
ARUP

Job Title
A66 NTP

Figure Title
**Plasticity chart
Section 7.5**

Job No
276821

Figure No
S7.5-2



Library: arup_wlbr_4-0-002-2_Report: G:\0A_00
 Database: C:\users\jamie.belkin\desktop\p106_brought\mtd_atf_120122_reva.gpi RevP1.1 (SO - Work in progress)

1,00

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 13-Jan-22

- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- BH BB022, 0.60m
- BH BB025, 0.60m
- ▲ BH BB026, 0.10m
- BH BB023, 1.00m
- BH BB024, 1.50m
- ▼ TP BB012, 0.80m
- ◆ TP BB013, 0.10m
- TP BB013, 0.55m

ARUP

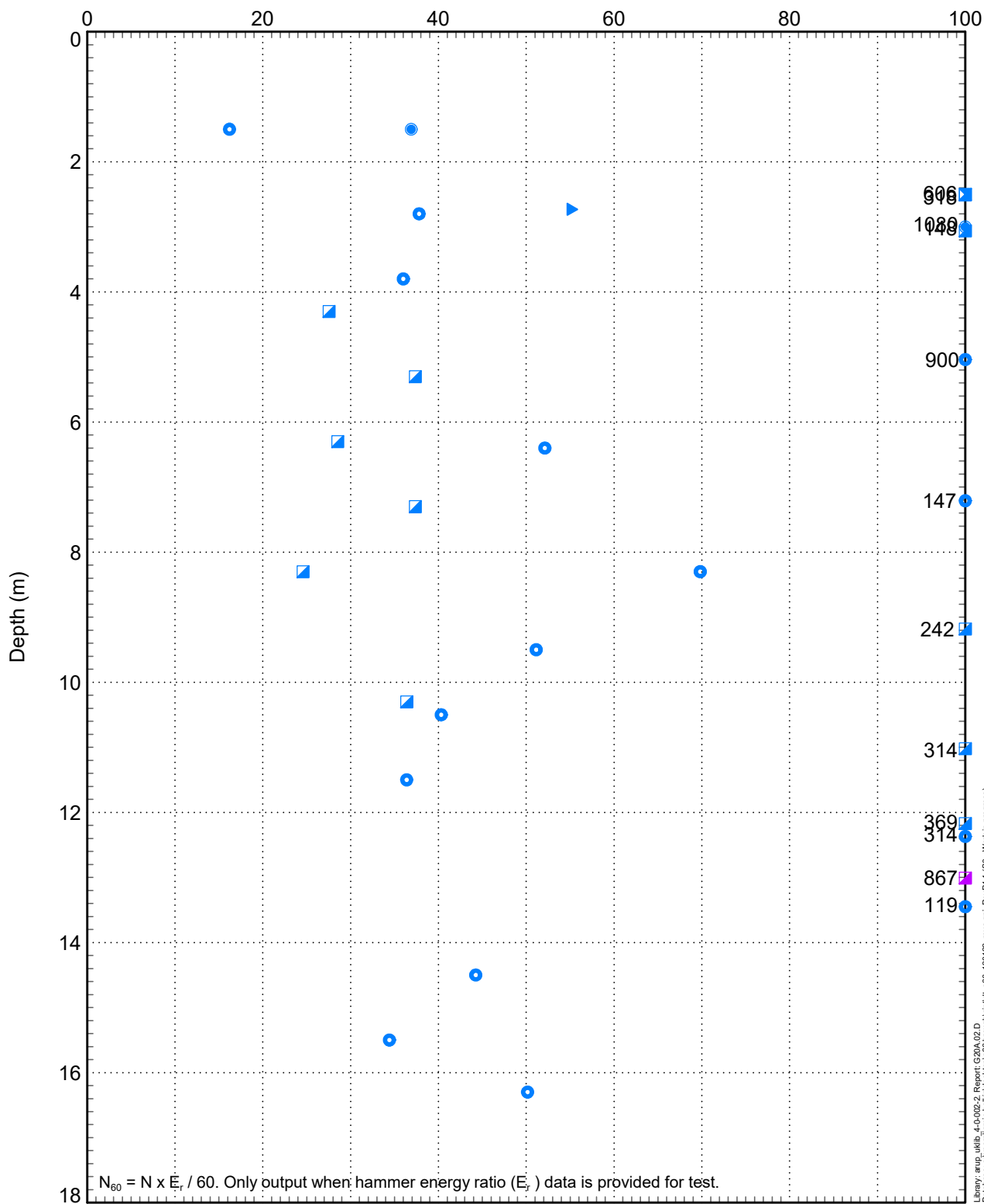
Job Title
A66 NTP

Figure Title
Particle size distribution
Section 7.5

Job No
276821

Figure No
S7.5-3

SPT N(60) value, N_{60}



$N_{60} = N \times E_r / 60$. Only output when hammer energy ratio (E_r) data is provided for test.

I:\Users\jmb\Documents\A66\2012\2 RevP1.1 (SO - Work in progress)
 Database: c:\users\jmb\Documents\A66\2012\2 RevP1.1 (SO - Work in progress)

- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- BH BB022
- BH BB025
- BH BB026
- BH BB023
- BH BB024

ARUP

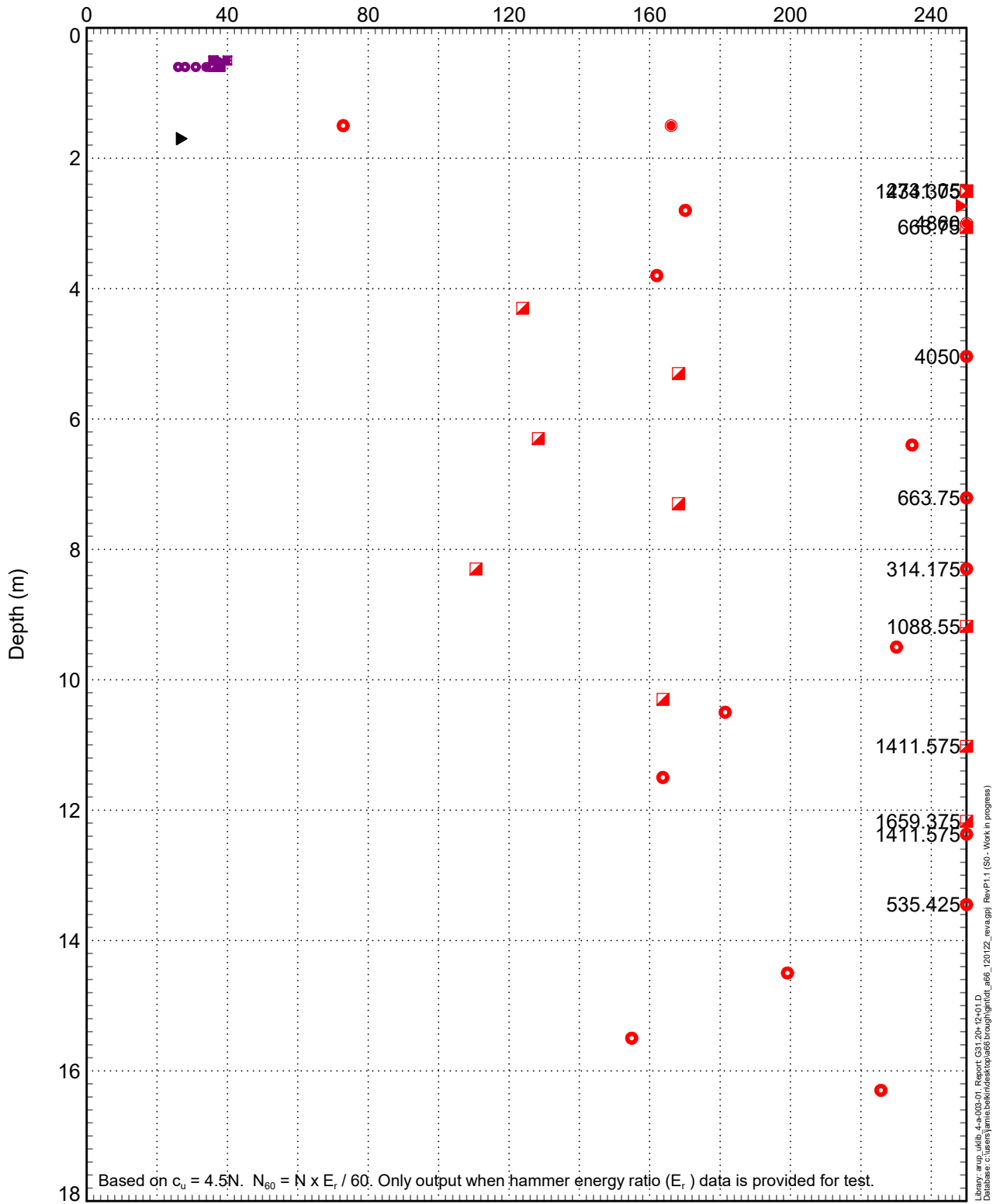
Job Title
A66 NTP

Figure Title
Standard penetration tests
Section 7.5

Job No
276821

Figure No
S7.5-4

Undrained shear strength, c_u (kPa)



I:\base\proj\18_44\2023_01_Renewal_C31_20x12\01_D...
 Database: c:\base\jamie.belkin\desktop\A66\Brough\mkt_a66_120122_rev.aopli Rev:P1.1 (SO - Work in progress)

- c_u from SPT (x4.5)
- From hand vane (peak)
- From triaxial test
- ▼ BH BB022
- ⊠ BH BB025
- BH BB026
- BH BB023
- BH BB024

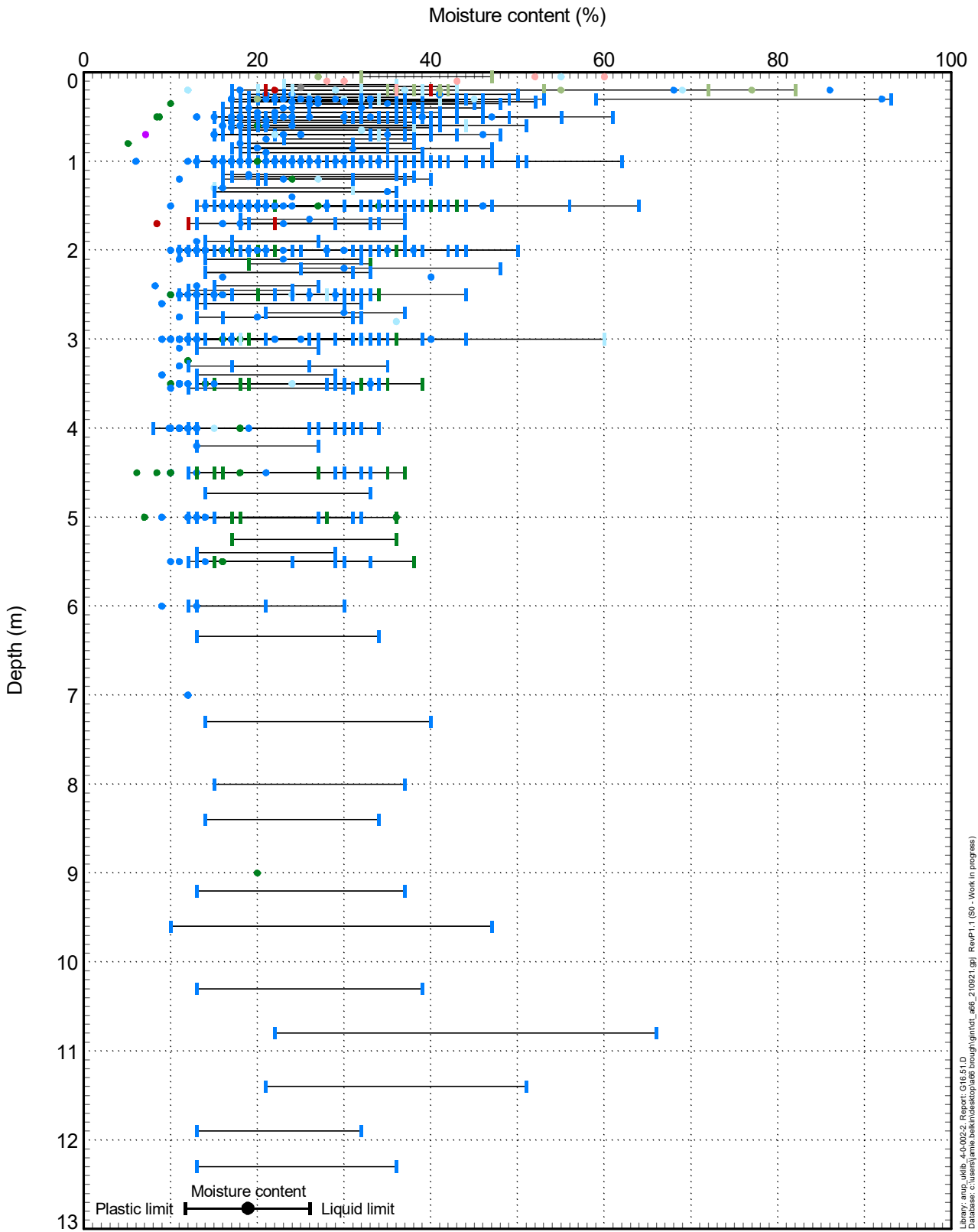
ARUP

Job Title
A66 NTP

Figure Title
Undrained shear strength
Section 7.5

Job No
276821

Figure No
S7.5-5



- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)

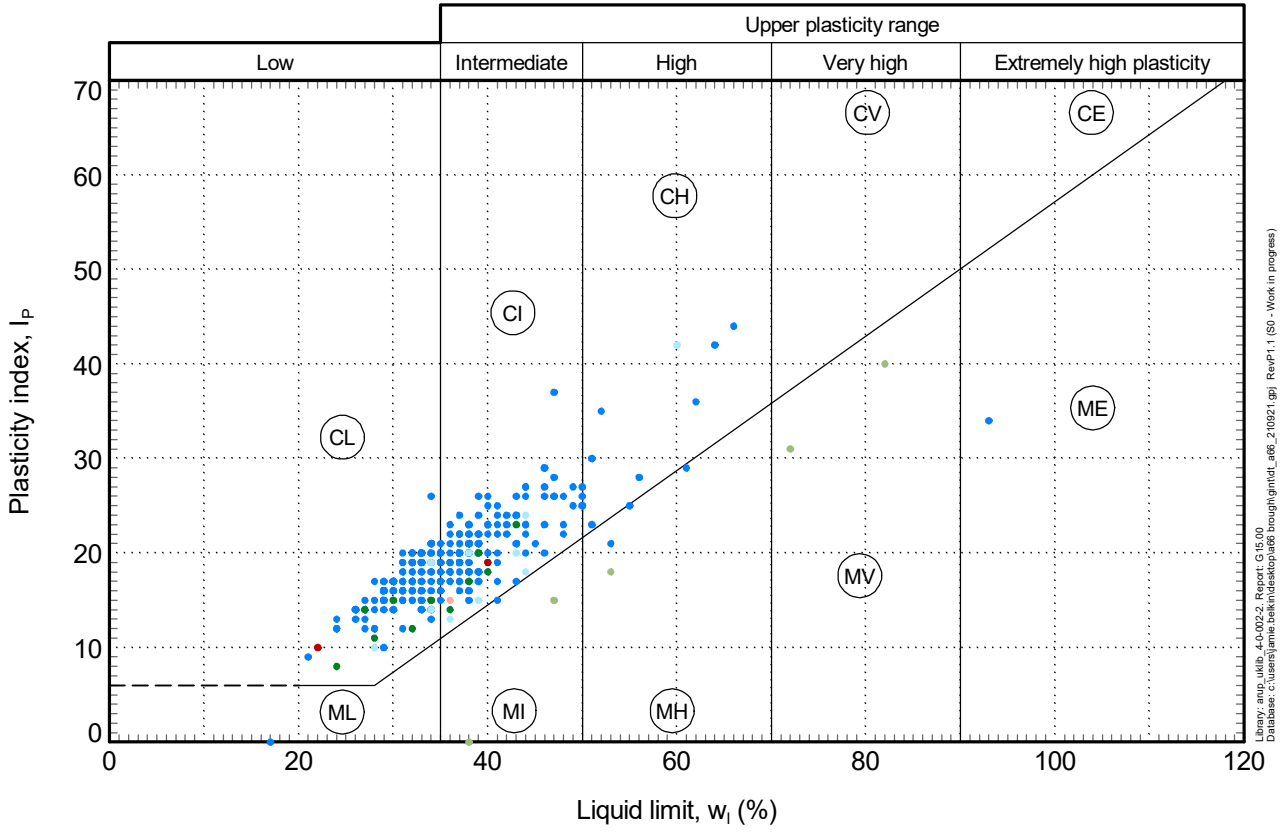
ARUP

Job Title
A66 NTP

Figure Title
Atterberg limits

Job No
276821

Figure No
S7-1



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Database: c:\user\jama.beek\ndesktop\A66 through\mid..._a66_210921.gpi; Rev: P1.1 (SO - Work in progress)

ARUP_gINT v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)

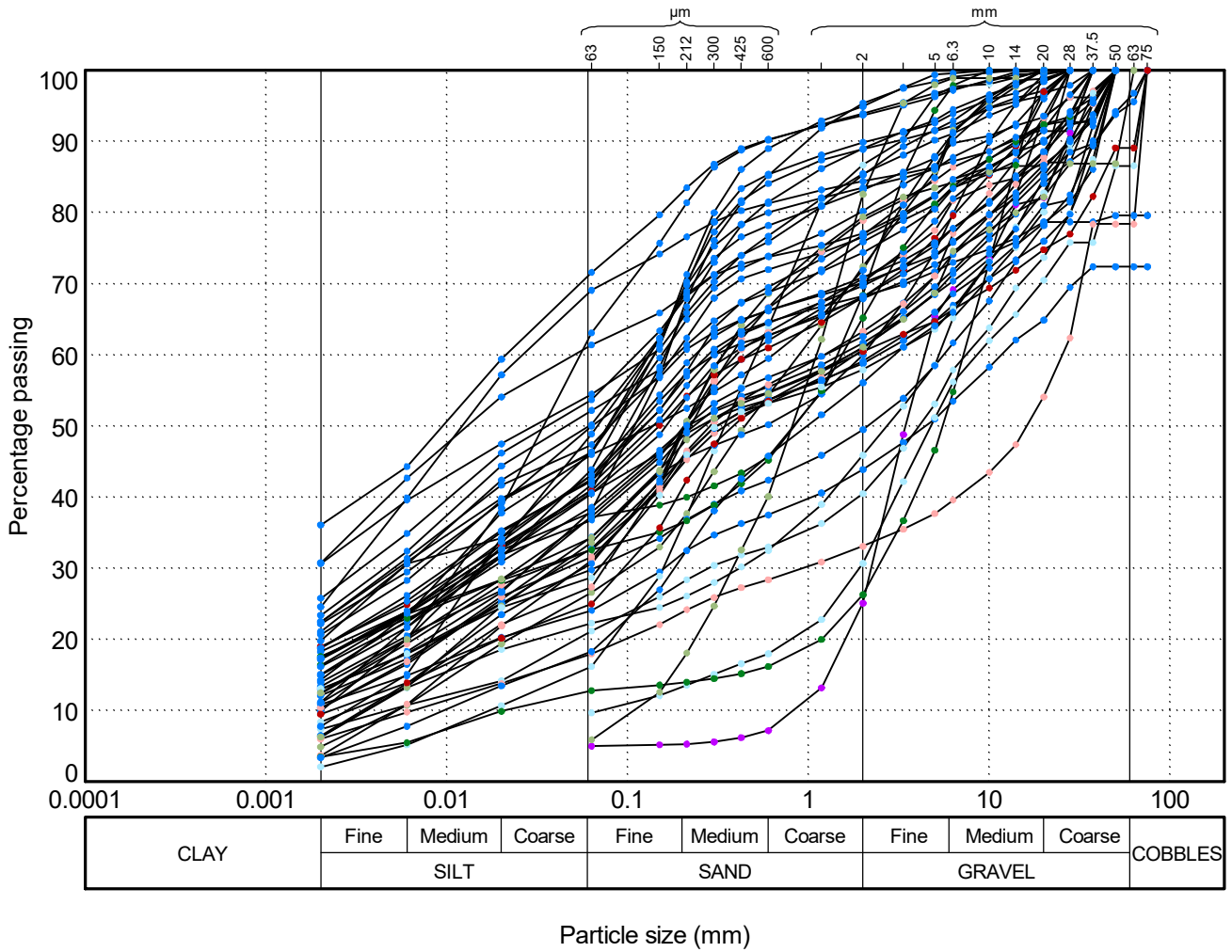
ARUP

Job Title
A66 NTP

Figure Title
Plasticity chart

Job No
276821

Figure No
S7-2



Library: arup_wlbr_4-0-002-2; Report: G:\0A-00
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1,00

ARUP_gINT v10.00.01.07; Made by Jamie Belkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Made Ground - Cohesive (MG-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)
- Unknown

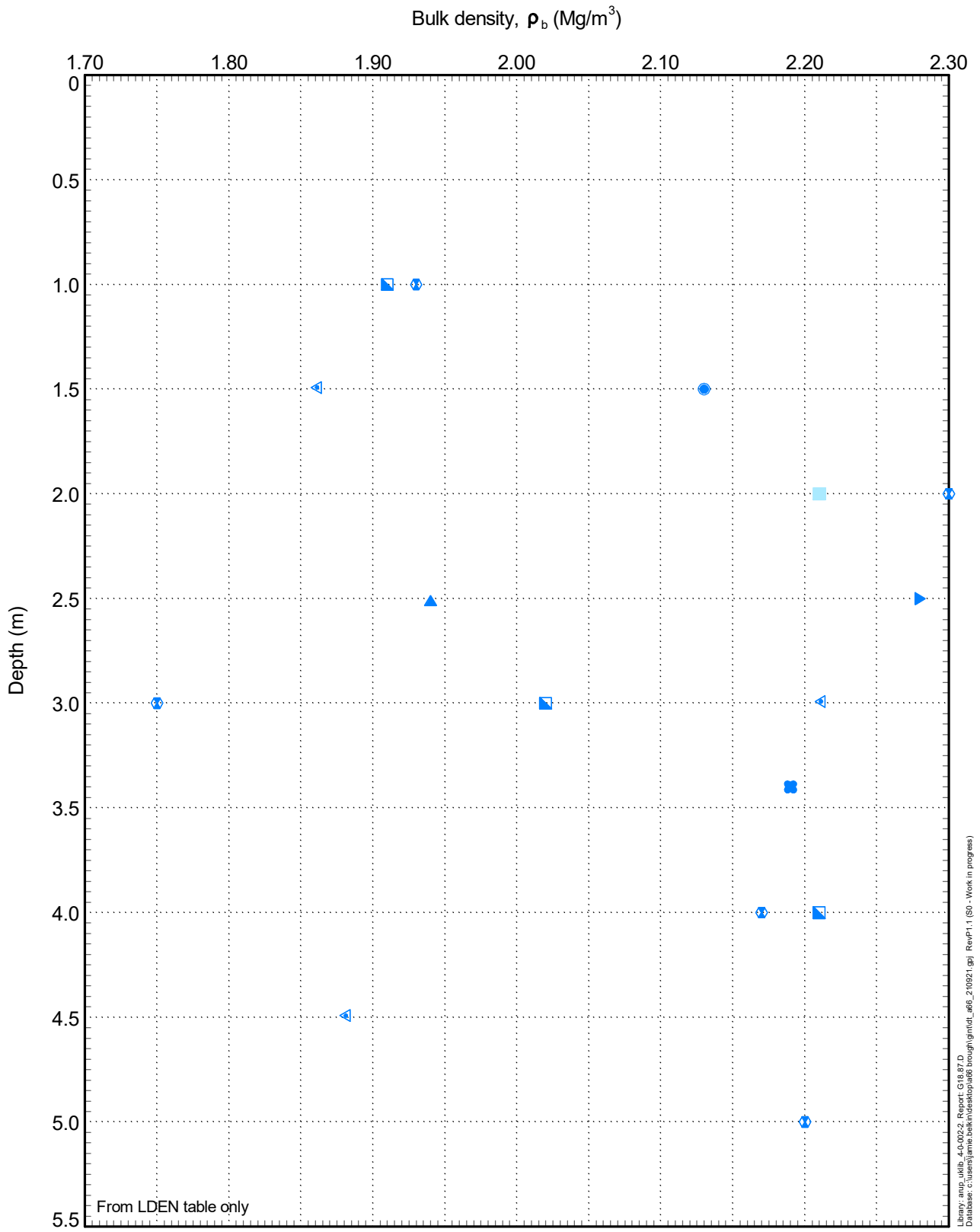
ARUP

Job Title
A66 NTP

Figure Title
Particle size distribution

Job No
276821

Figure No
S7-3



I:\Users\james\Documents\A66_210821.gpr RevP1.1 (S0 - Work in progress)
 Database: c:\users\james\Documents\A66_210821.gpr

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB005
- ▲ BH BB006
- BH BB013
- ◼ NY91SE44/A
- ◻ NY91SE44/C
- ◻ NY91SE44/D
- ▼ BH BB007
- BH BB009

ARUP

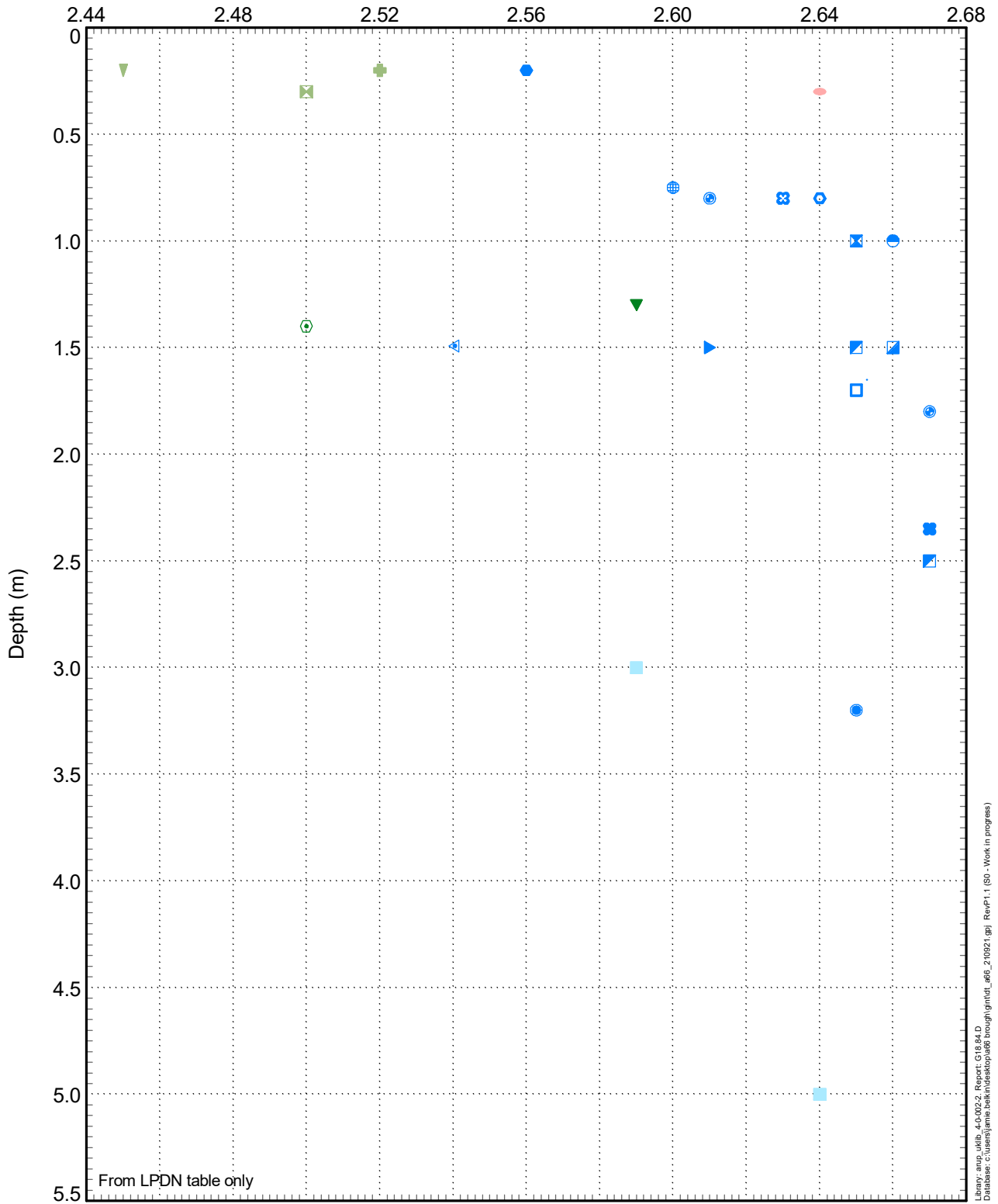
Job Title
A66 NTP

Figure Title
Bulk density

Job No
276821

Figure No
S7-4

Particle density, ρ_s (Mg/m³)



I:\projects\ntp\A66\A66_210921.gpj RevP1.1 (S0 - Work in progress)
 Database: c:\users\jamie.belkin\desktop\A66

ARUP_gINT v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- | | |
|------------------------------------|------------|
| ■ Mudstone (RK-Mdst) | ● BH BB009 |
| ■ Made Ground - Granular (MG-G) | ■ BH BB024 |
| ■ Glacial Deposits Cohesive (GD-C) | ■ WS BB001 |
| ■ Glacial Deposits Granular (GD-G) | ▲ TP BB001 |
| ■ Topsoil (TOP) | ● TP BB002 |
| ■ BH BB005 | ▼ TP BB003 |
| ■ BH BB013 | ■ TP BB004 |
| ■ BH BB015 | ● TP BB006 |
| ■ BH BB016 | ○ TP BB008 |
| ■ BH BB017 | ● TP BB009 |
| ■ BH BB007 | □ TP BB011 |
| ■ BH BB008 | ■ TP BB013 |
| | ○ TP BB014 |
| | ● BH BB003 |

ARUP

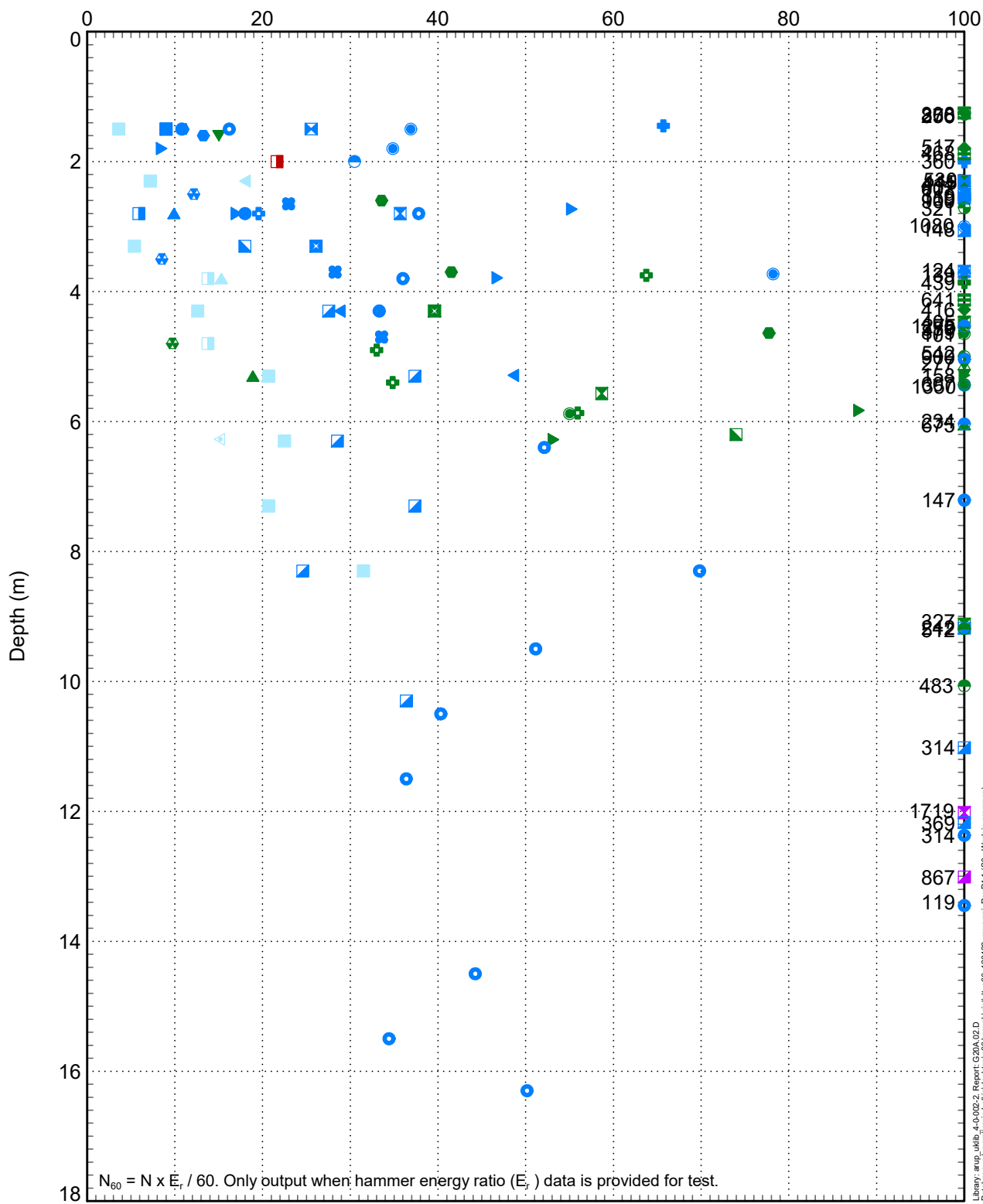
Job Title
A66 NTP

Figure Title
Particle density

Job No
276821

Figure No
S7-5

SPT N(60) value, N_{60}



I:\Users\j.miller_46\OneDrive\Documents\Projects\A66\A66_NTP\A66_NTP_SPT\A66_NTP_SPT_S7-6.mxd
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- | | | |
|------------------------------------|--------------|------------|
| ■ Mudstone (RK-Mdst) | ■ BH BB019 | ● BH BB023 |
| ■ Limestone (RK-Lst) | ▲ BH BB021 | ■ BH BB024 |
| ■ Glacial Deposits Cohesive (GD-C) | ▼ BH BB022 | ■ BH BB002 |
| ■ Made Ground - Cohesive (MG-C) | ⊗ BH BB025 | ⊗ WS BB001 |
| ■ Glacial Deposits Granular (GD-G) | ● BH BB026 | ⊗ WS BB002 |
| ● BH BB004 | ■ NY91SE44/A | ● BH BB003 |
| ■ BH BB005 | ▲ NY91SE44/D | |
| ▲ BH BB006 | ▼ BH BB007 | |
| ■ BH BB013 | ⊗ BH BB008 | |
| ● BH BB015 | ● BH BB009 | |
| ▼ BH BB016 | ● BH BB010 | |
| ⊕ BH BB017 | ◆ BH BB011 | |
| | ■ BH BB012 | |
| | ⊕ BH BB014 | |
| | ■ BH BB020 | |

ARUP

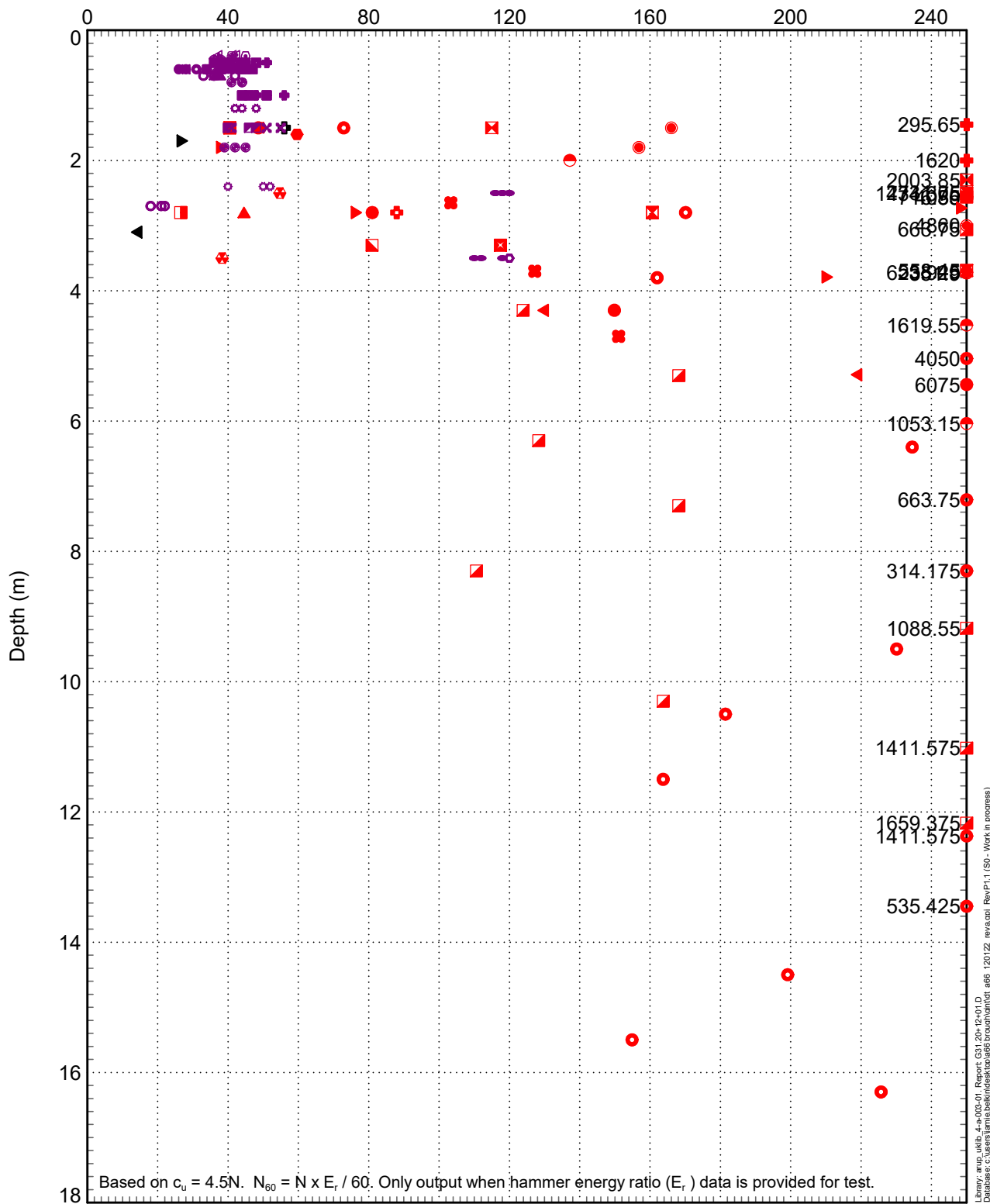
Job Title
A66 NTP

Figure Title
Standard penetration tests

Job No
276821

Figure No
S7-6

Undrained shear strength, c_u (kPa)



I:\Users\jmb\p1\A66\A66_NTP\A66_NTP_RevP1.1 (SO - Work in progress)
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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 22-Feb-22

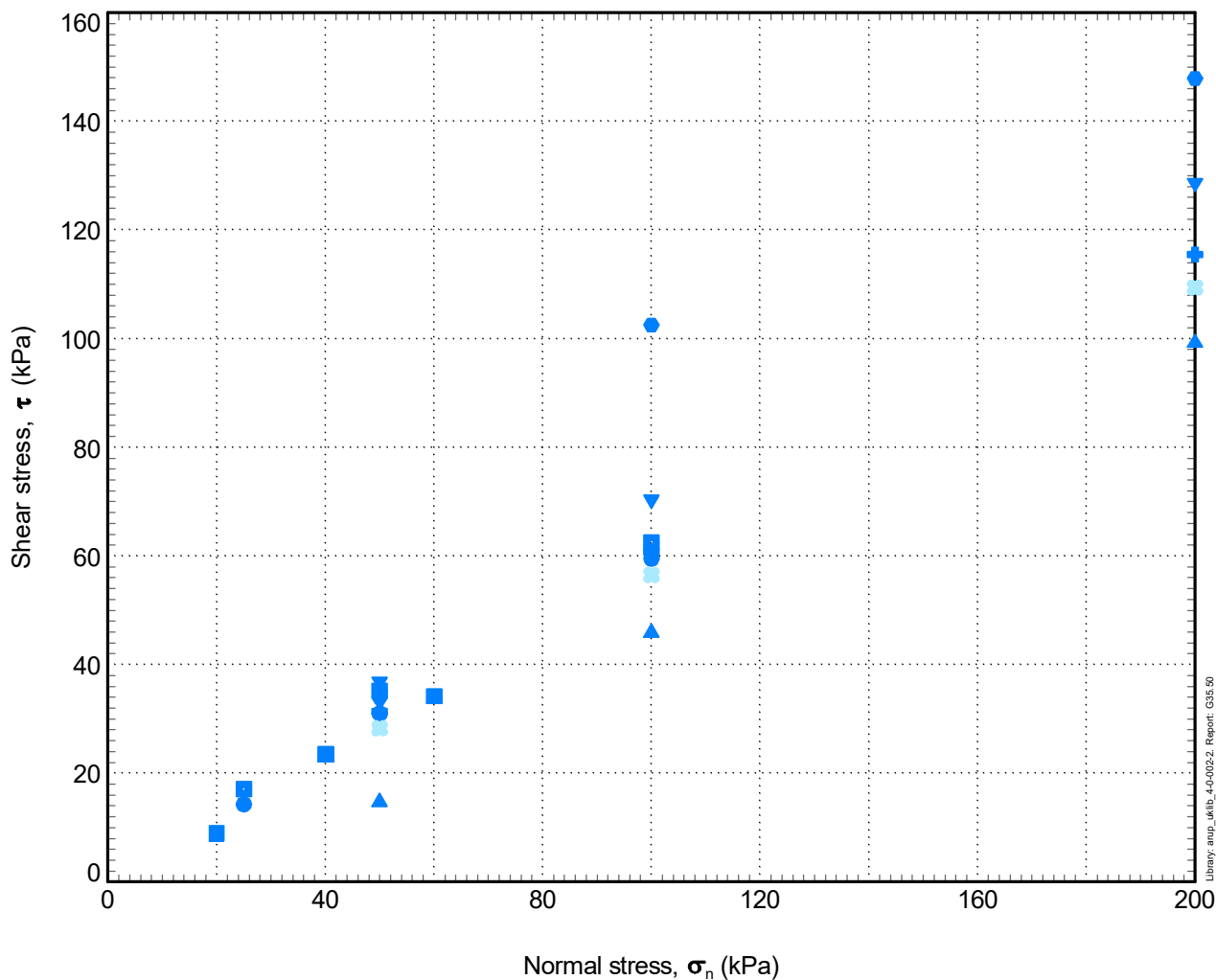
- | |
|---|
| <ul style="list-style-type: none"> ■ c_u from SPT (x4.5) ■ From hand vane (peak) ■ From triaxial test ● BH BB004 ■ BH BB005 ▲ BH BB006 ● BH BB013 ● BH BB015 ▼ BH BB016 ▲ BH BB017 ■ BH BB019 ▲ BH BB021 ▼ BH BB022 ■ BH BB025 ● BH BB026 ■ NY91SE44/A ▼ BH BB007 ■ BH BB008 ● BH BB009 ■ BH BB014 ■ BH BB020 ● BH BB023 ■ BH BB024 ■ BH BB002 ■ WS BB001 ■ WS BB002 ▲ TP BB001 ● TP BB002 ■ TP BB004 ● TP BB005 ● TP BB006 ■ TP BB007 ● TP BB008 ● TP BB009 ○ TP BB010 ○ TP BB014 ● BH BB003 |
|---|

ARUP

Job Title
A66 NTP

Figure Title
**Undrained shear strength
GLACIAL DEPOSITS COHESIVE**

Job No 276821	Figure No S7-7
-------------------------	--------------------------



- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB004, 1.20m
- BH BB004, 2.50m
- ▲ BH BB006, 1.20m
- BH BB006, 3.50m
- BH BB013, 3.40m
- ▼ BH BB007, 3.20m
- BH BB008, 2.50m
- BH BB009, 1.50m

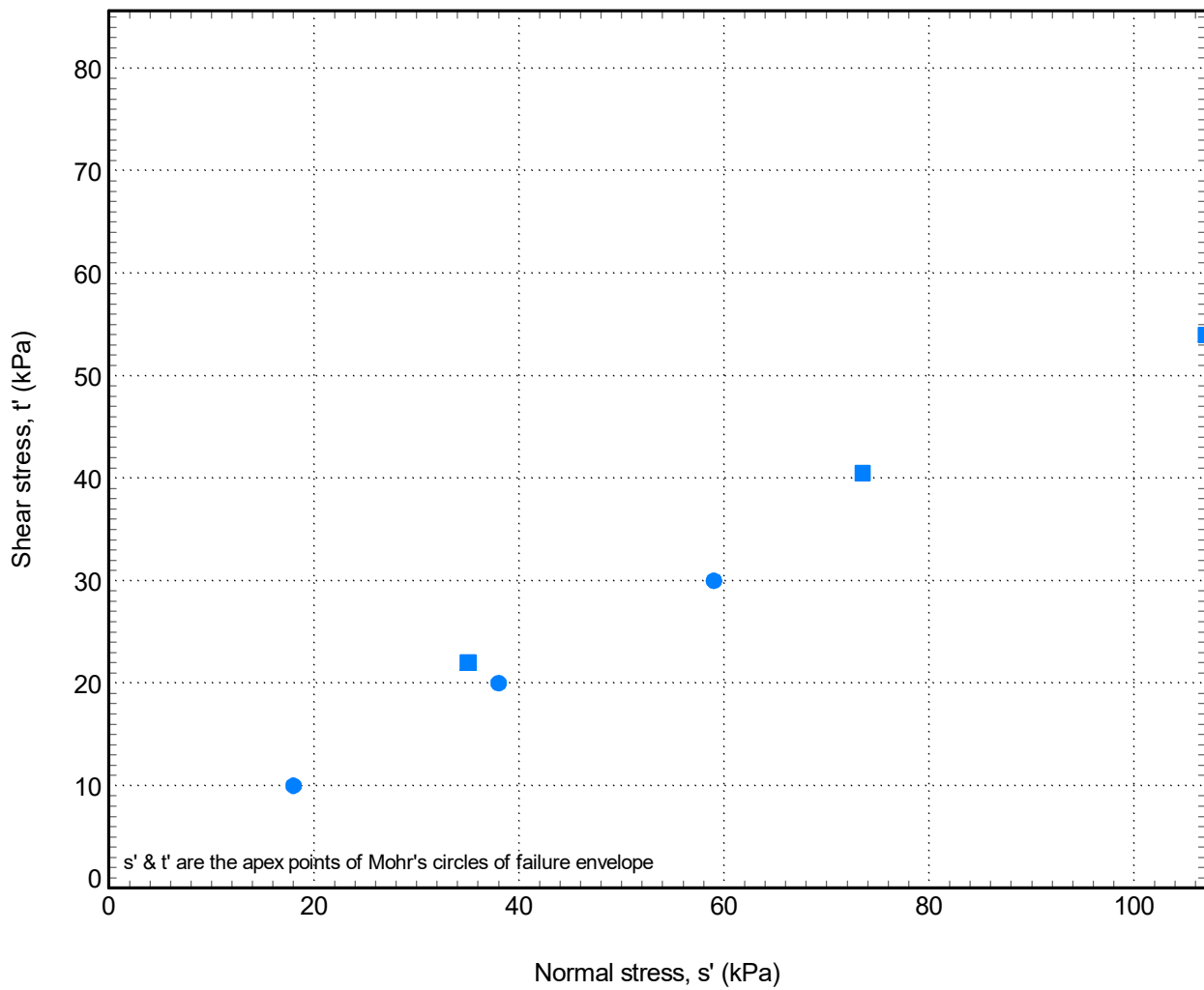
ARUP

Job Title
A66 NTP

Figure Title
Shear box tests

Job No
276821

Figure No
S7-8



U:\Data\proj\A66\A66_210821_2_Report_CS1.dwg Database: c:\users\jamie.belkin\desktop\A66_brought\gint.dwg RevP1.1 (S0 - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- BH BB008, 1.74m
- BH BB020, 2.23m

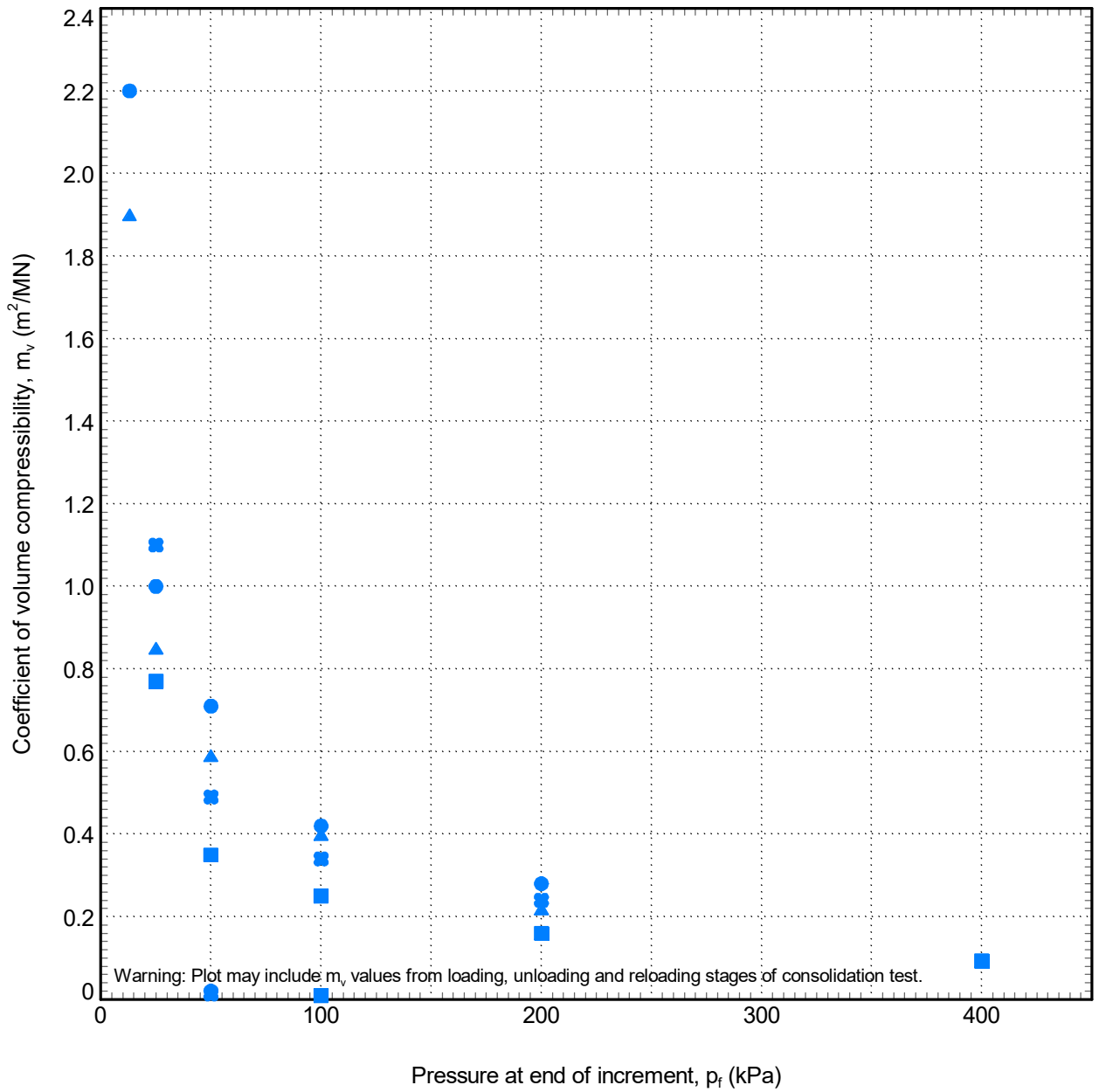
ARUP

Job Title
A66 NTP

Figure Title
Triaxial t' v s'

Job No
276821

Figure No
S7-9



Library: arup_uklib_4-0-002; Report: G43.12
 Database: C:\users\jamie.bellin\desktop\arup\light\ud_lab6_210921.gpj; RevP1.1 (SD - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Bellin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- BH BB021, 1.20m
- BH BB021, 3.00m
- ▲ BH BB022, 1.50m
- BH BB020, 2.04m

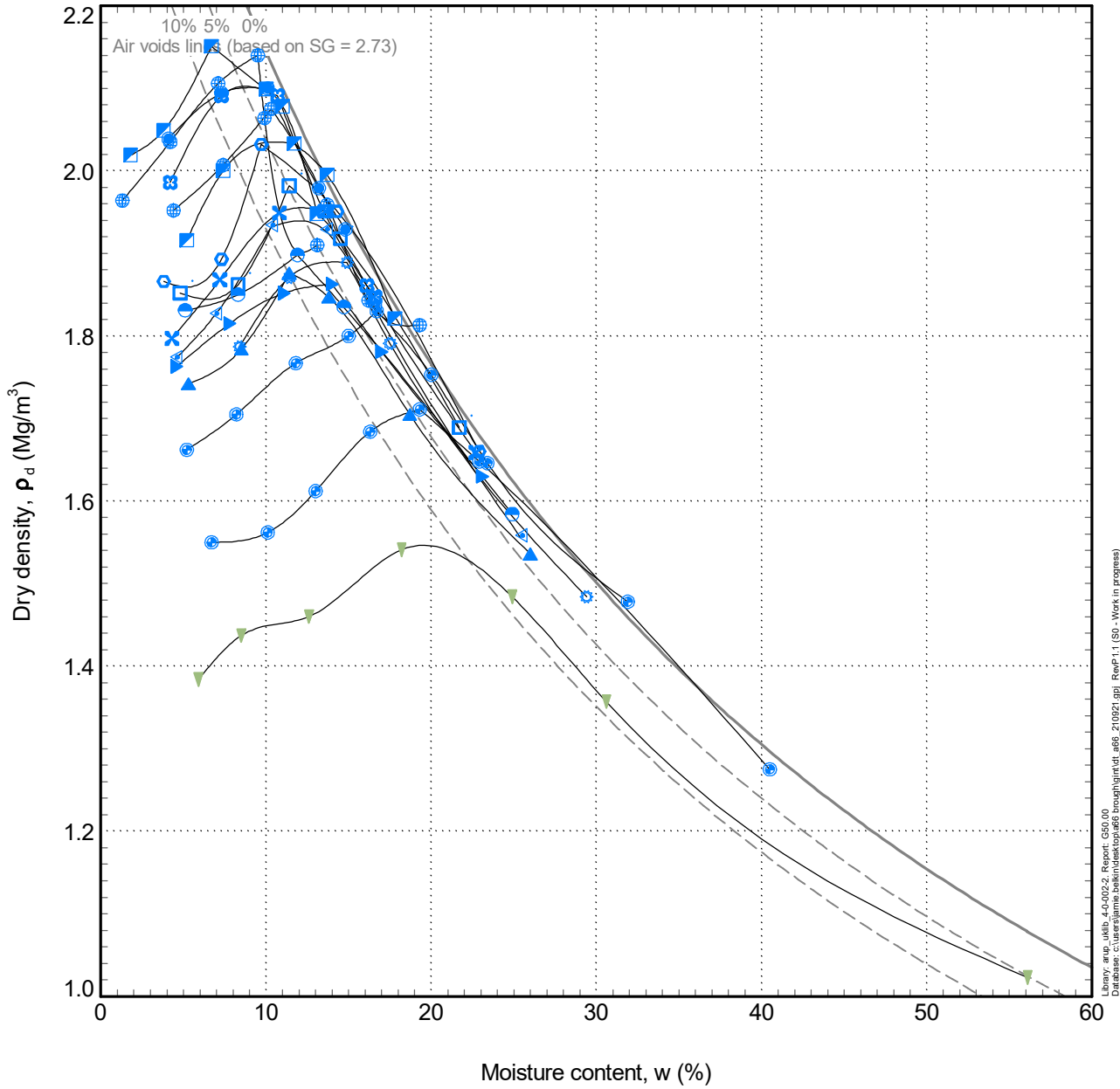
ARUP

Job Title
A66 NTP

Figure Title
Volume compressibility

Job No
276821

Figure No
S7-10



Library: arup_ukhb_4-0-002; Report: G50.00
Database: C:\users\jamie.belkin\desktop\add through\gintd_lab6_210921.gpi RevP1.1 (SO - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- ▲ BH BB006
- ▼ BH BB007
- BH BB009
- ▲ TP BB001
- TP BB002
- TP BB003
- ▼ TP BB004
- TP BB005
- ✕ TP BB007
- TP BB009
- TP BB011
- ⊗ TP BB013
- TP BB014
- BH BB003

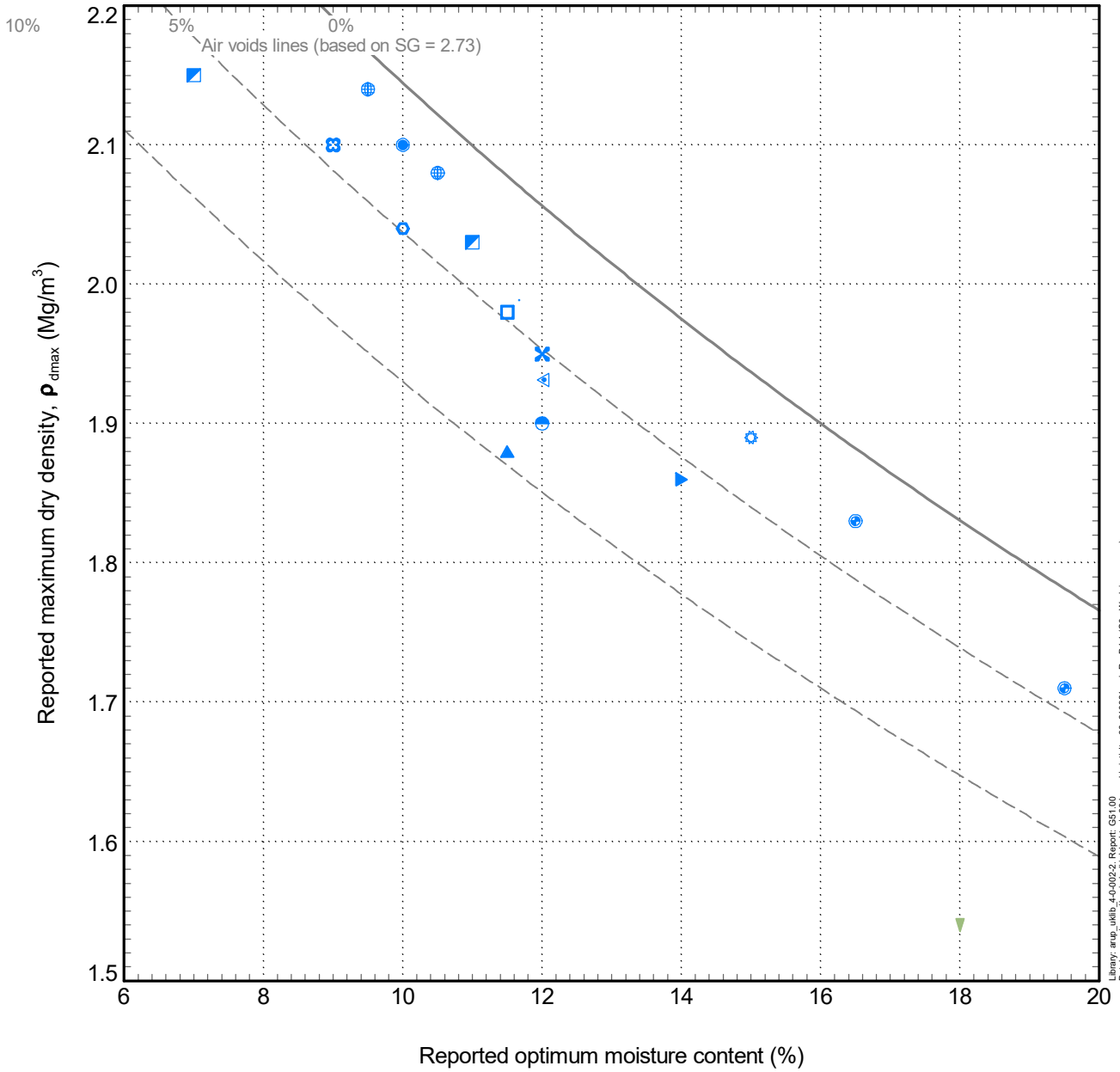
ARUP

Job Title
A66 NTP

Figure Title
Compaction tests

Job No
276821

Figure No
S7-11



Library: arup_uklib_4-0-002-2; Report: G51.00
 Database: C:\users\jamie.bellin\desktop\add through\ntul_lab6_210921.gpj; RevP1.1 (SD - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Bellin on 18-Nov-21

- Glacial Deposits Cohesive (GD-C)
- Topsoil (TOP)
- ▲ BH BB006
- ▼ BH BB007
- BH BB009
- ⊙ TP BB001
- ⊕ TP BB002
- ⊖ TP BB003
- ⊗ TP BB004
- ⊘ TP BB005
- ⊙ TP BB007
- ⊕ TP BB009
- ⊖ TP BB011
- ⊗ TP BB013
- ⊙ TP BB014
- BH BB003

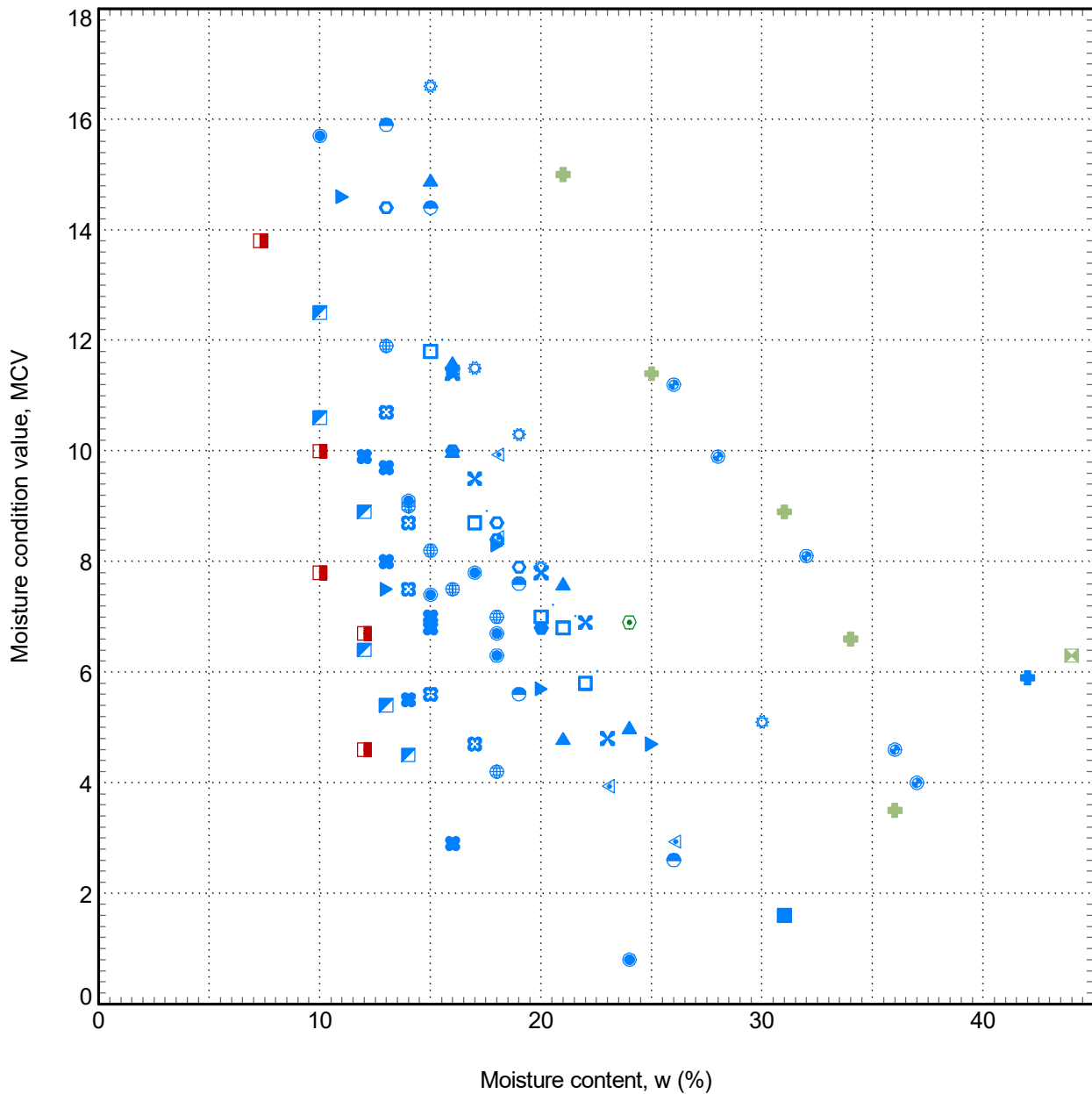
ARUP

Job Title
A66 NTP

Figure Title
OMC and maximum dry density

Job No
276821

Figure No
S7-12



Library path: C:\Users\jamie.belkin\desktop\A66_braughing\ntd_a66_210821.gpi RevP1.1 (SO - Work in progress)
 Database: C:\Users\jamie.belkin\desktop\A66_braughing\ntd_a66_210821.gpi RevP1.1 (SO - Work in progress)

ARUP_gINT_v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- | | |
|------------------------------------|------------|
| ■ Mudstone (RK-Mdst) | ▲ TP BB001 |
| ■ Glacial Deposits Cohesive (GD-C) | ● TP BB002 |
| ■ Made Ground - Cohesive (MG-C) | ■ TP BB004 |
| ■ Topsoil (TOP) | ⊗ TP BB005 |
| ■ BH BB005 | ⊗ TP BB007 |
| ▲ BH BB006 | ⊗ TP BB008 |
| ■ BH BB013 | ● TP BB009 |
| ● BH BB015 | □ TP BB011 |
| ■ BH BB017 | ⊗ TP BB013 |
| ▼ BH BB007 | ⊗ TP BB014 |
| ● BH BB009 | ● BH BB003 |
| ■ BH BB002 | |
| ■ WS BB001 | |

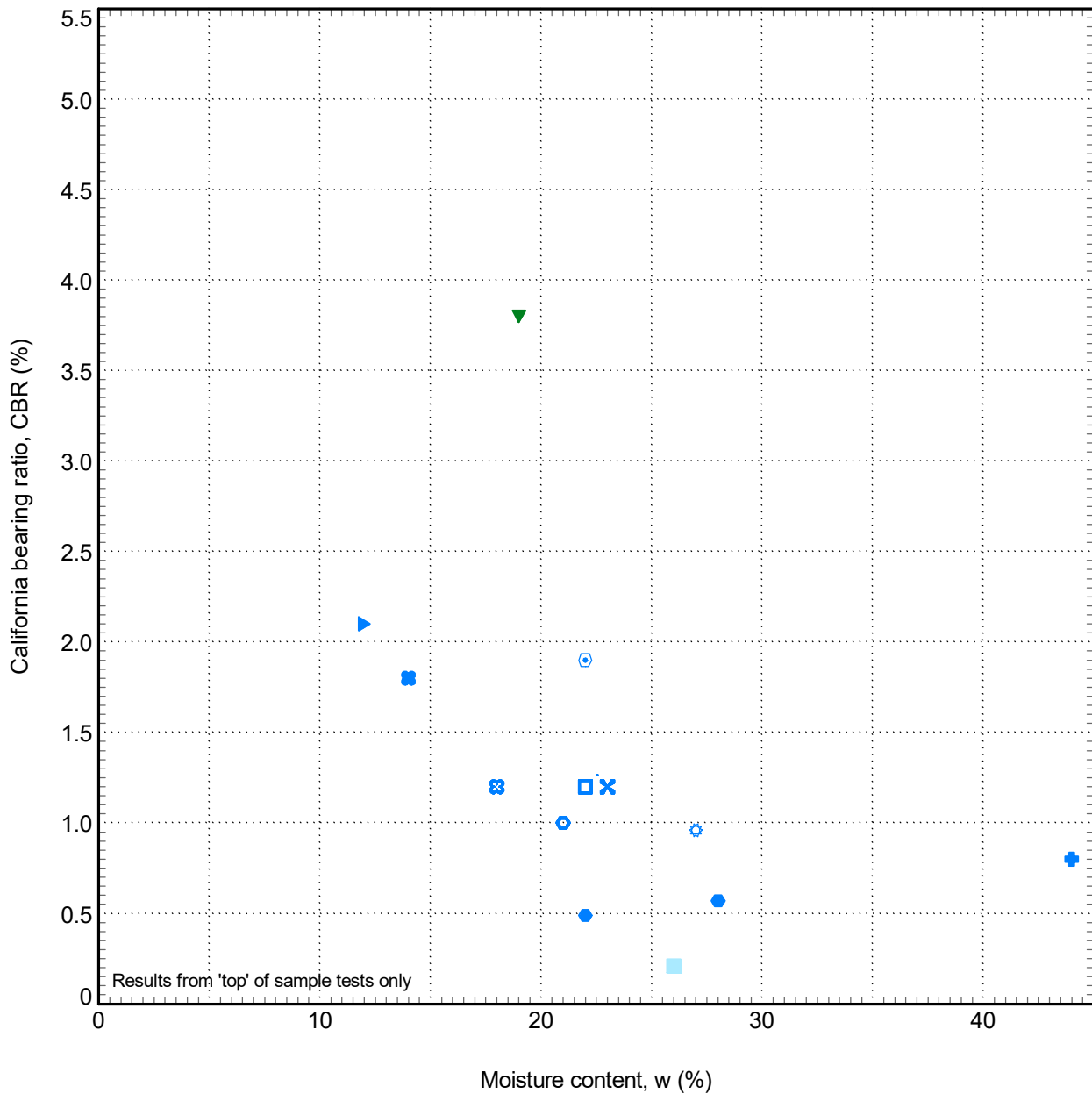
ARUP

Job Title
A66 NTP

Figure Title
MCV vs moisture content

Job No
276821

Figure No
S7-13



Library path: C:\Users\jamie.belkin\desktop\A66\braag\gint\A66_210821.gpi RevP1.1 (SO - Work in progress)
Database: C:\Users\jamie.belkin\desktop\A66\braag\gint\A66_210821.gpi RevP1.1 (SO - Work in progress)

ARUP_gINT_v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Made Ground - Granular (MG-G)
- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB005
- BH BB013
- BH BB015
- BH BB016
- BH BB017
- BH BB007
- ⊗ TP BB005
- ⊗ TP BB007
- ⊙ TP BB008
- TP BB011
- ⊗ TP BB013
- ⊙ TP BB014

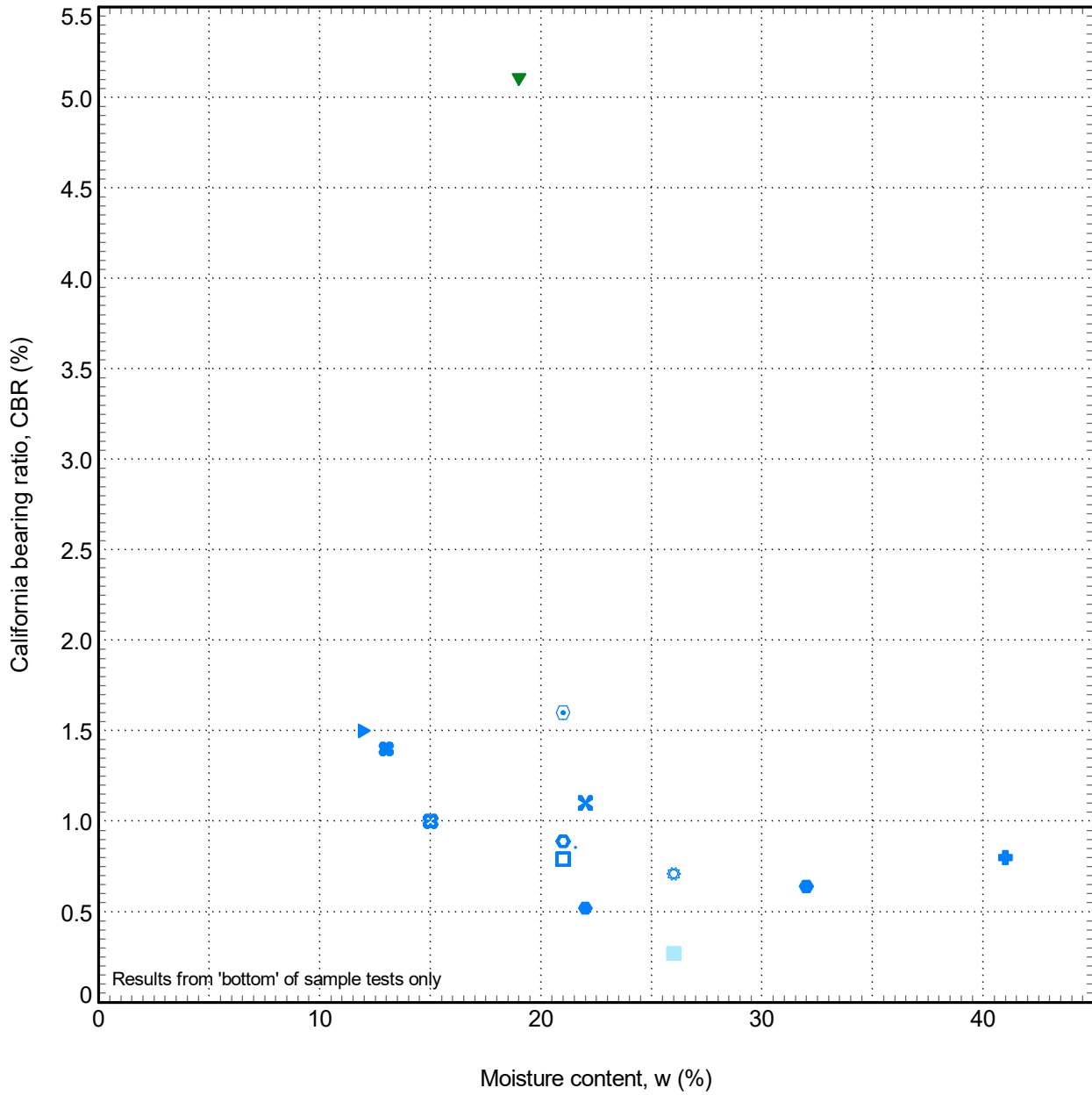
ARUP

Job Title
A66 NTP

Figure Title
Lab CBR vs moisture content

Job No
276821

Figure No
S7-14



Library path: C:\Users\jamie.belkin\desktop\arup\gint\ar66_210821.gpi RevP1.1 (SO - Work in progress)
 Database: C:\Users\jamie.belkin\desktop\arup\gint\ar66_210821.gpi RevP1.1 (SO - Work in progress)

ARUP_gINT_v10.00.01.07, Made by Jamie Belkin on 18-Nov-21

- | | |
|------------------------------------|------------|
| ■ Mudstone (RK-Mdst) | ⊙ TP BB008 |
| ■ Made Ground - Granular (MG-G) | □ TP BB011 |
| ■ Glacial Deposits Cohesive (GD-C) | ⊗ TP BB013 |
| ■ Glacial Deposits Granular (GD-G) | ⊙ TP BB014 |
| ■ BH BB005 | |
| ■ BH BB013 | |
| ■ BH BB015 | |
| ■ BH BB016 | |
| ■ BH BB017 | |
| ■ BH BB007 | |
| ⊗ TP BB005 | |
| ⊗ TP BB007 | |

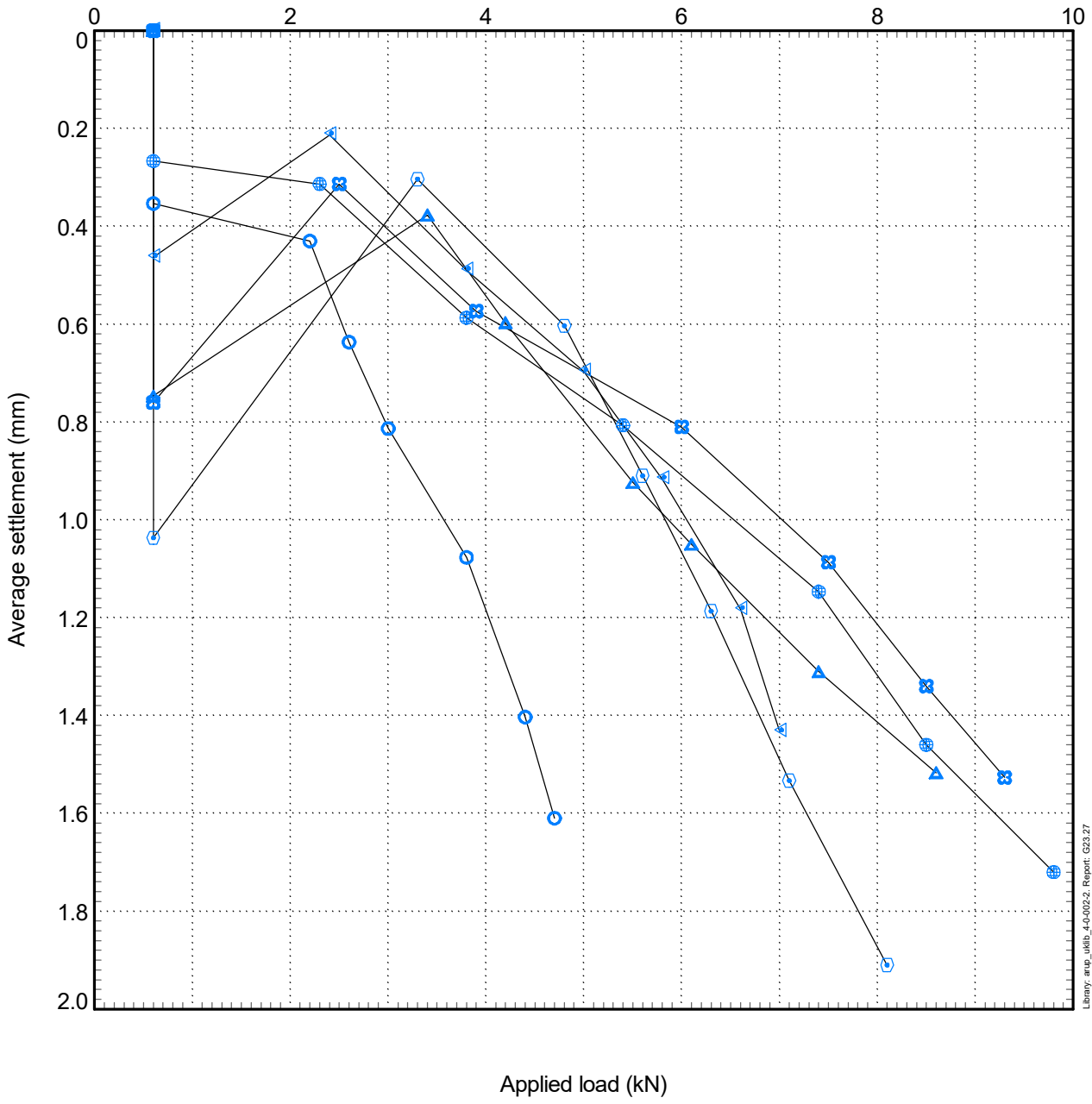
ARUP

Job Title
A66 NTP

Figure Title
Lab CBR vs moisture content

Job No
276821

Figure No
S7-15



Library path: \\fs1-4-000-2\Projects\62527
 Database: c:\users\jamie.belkin\desktop\plate_loading\ntd_a66_210021.dwg RevP.1.1 (SO - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- ▲ TP BB001
- TP BB002
- TP BB008
- TP BB010
- ▲ TP BB012
- ⊗ TP BB013

ARUP

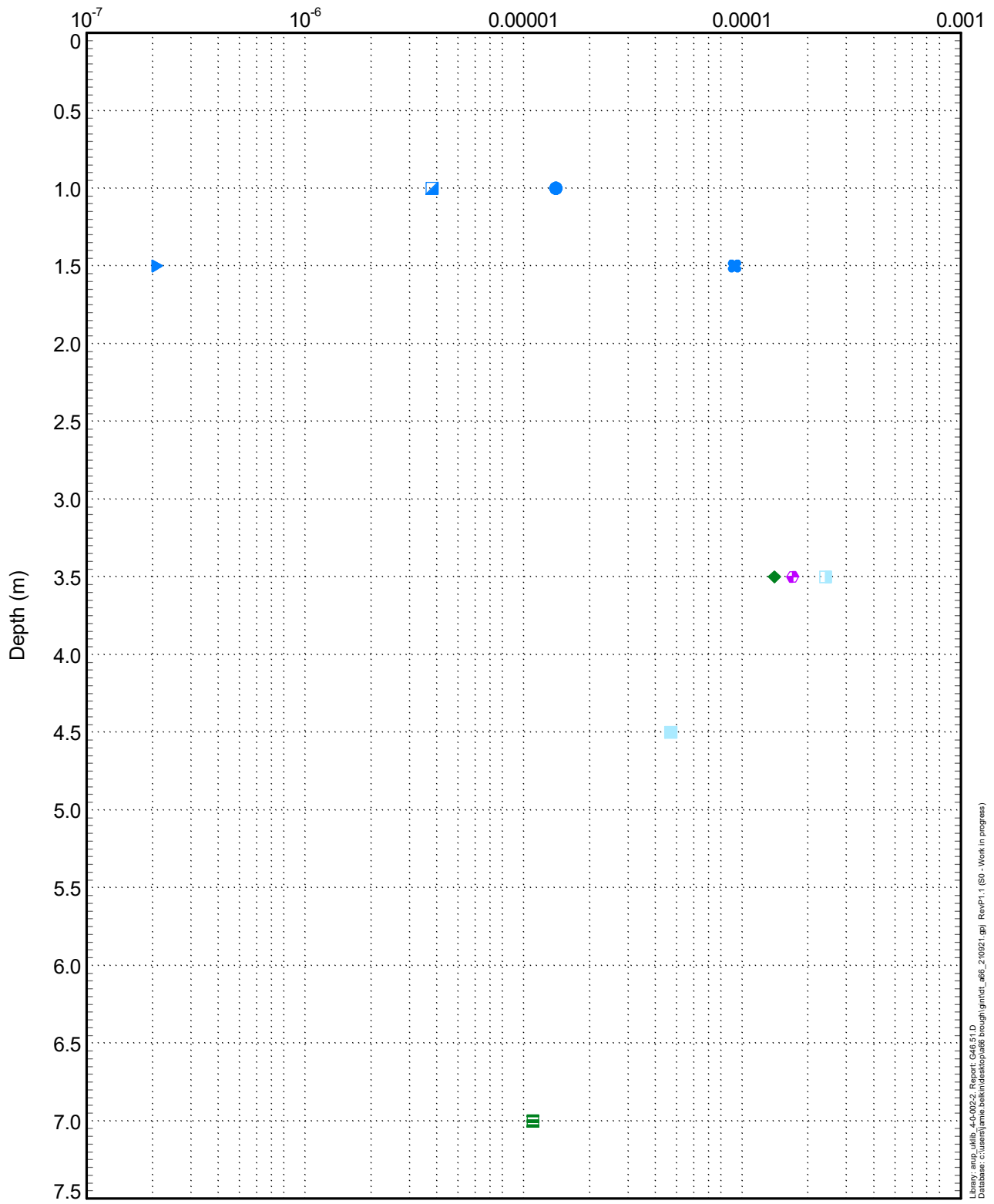
Job Title
A66 NTP

Figure Title
Plate loading tests

Job No
276821

Figure No
S7-16

Permeability, k (m/s)



I:\Users\jmb\p18_40_2022_2_Report_C66.51.D
 Database: c:\users\jamb\p18_40_2022_2\Report_C66.51.D

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB004
- BH BB005
- BH BB013
- ▼ BH BB022
- ◆ BH BB011
- ▨ BH BB012
- ⊕ BH BB018
- ▣ BH BB024
- BH BB002

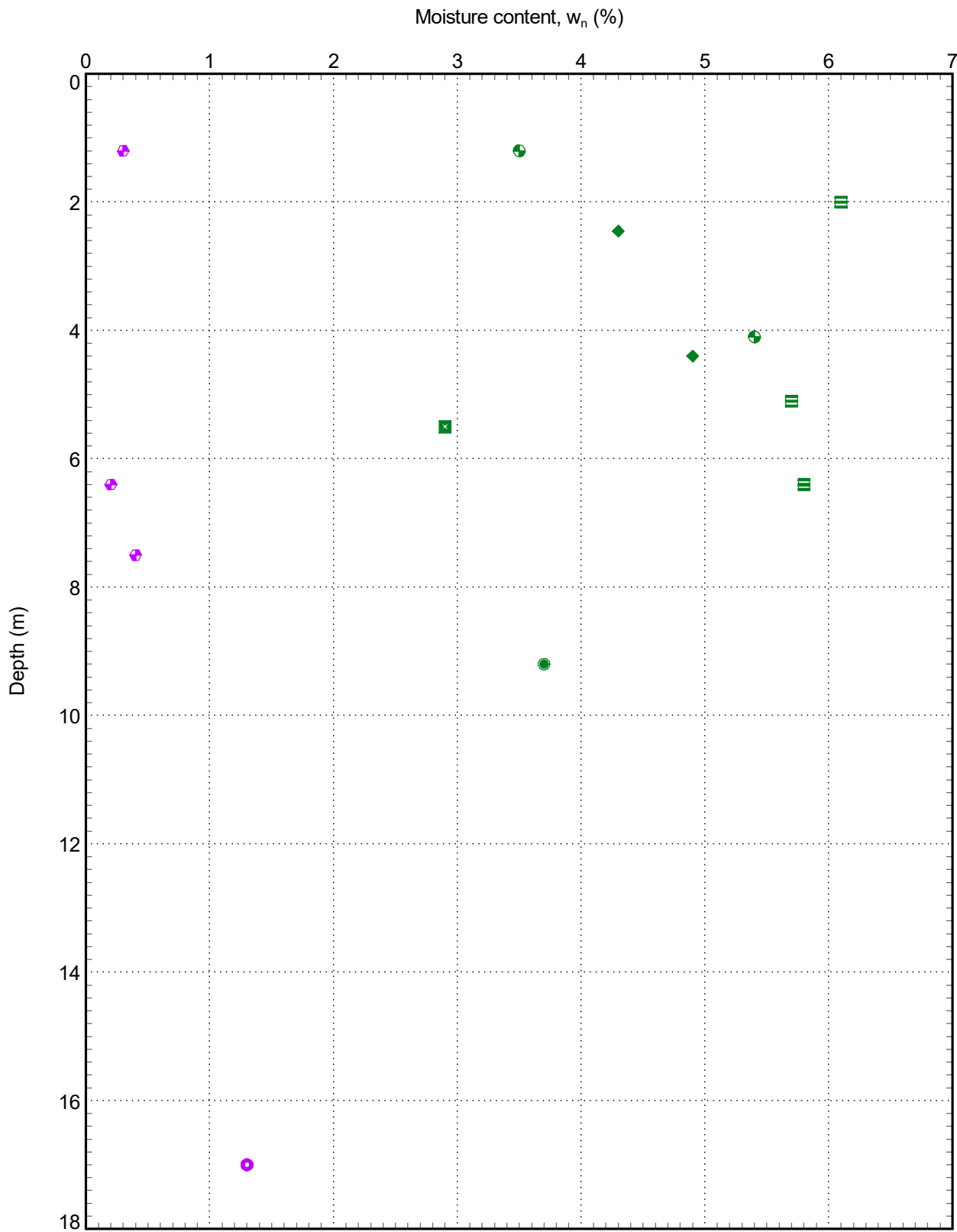
ARUP

Job Title
A66 NTP

Figure Title
In situ permeability

Job No
276821

Figure No
S7-17



I:\Users\jamie.belkin\Documents\A66_210821.gpj RevP1.1 (S0 - Work in progress)
 Database: c:\users\jamie.belkin\desktop\A66

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- BH BB009
- ⊕ BH BB010
- ◆ BH BB011
- ⊠ BH BB012
- ⊕ BH BB018
- ⊠ BH BB020
- BH BB023

ARUP

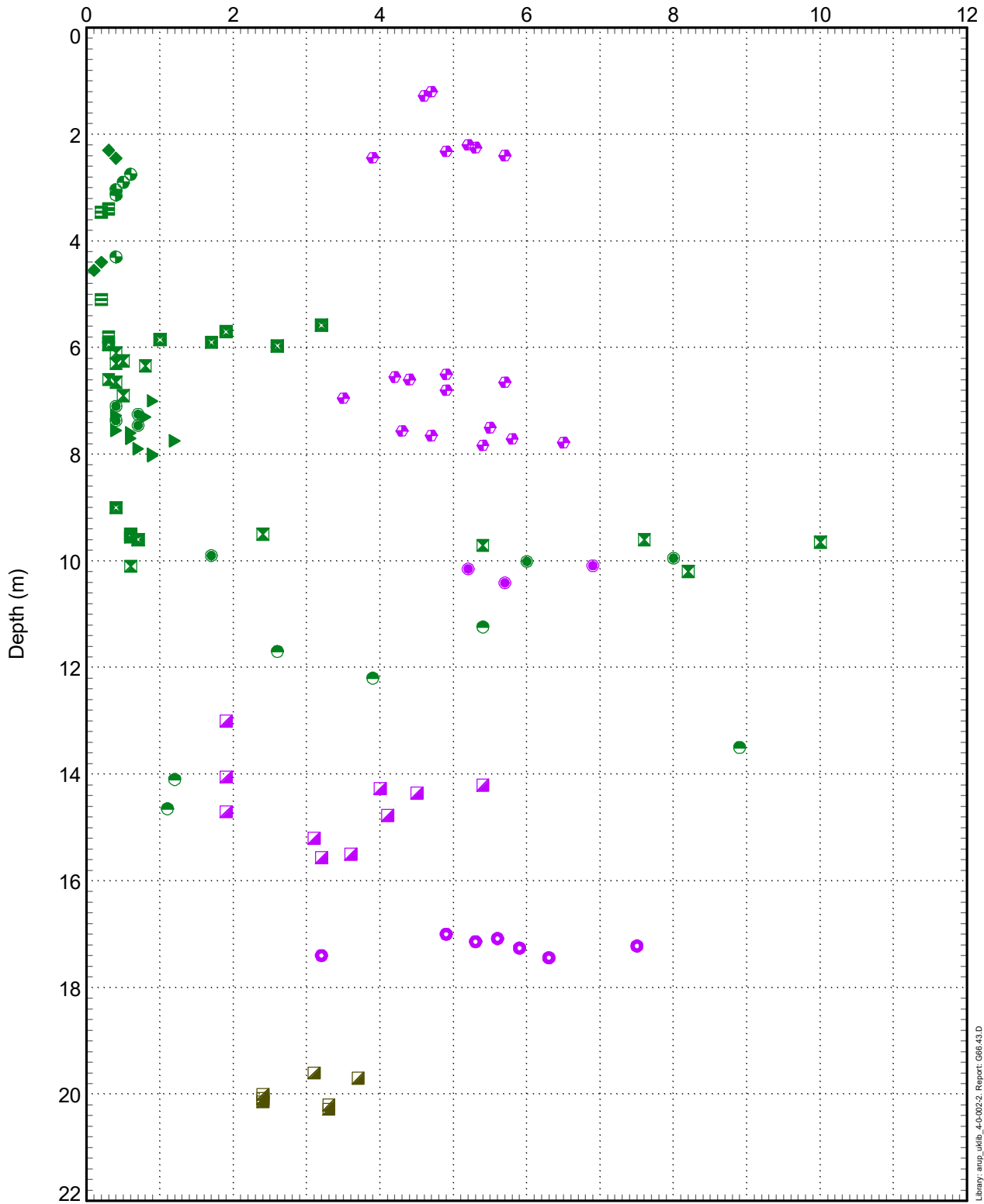
Job Title
A66 NTP

Figure Title
Rock moisture content

Job No
276821

Figure No
S7-18

Point load index (size corrected), $I_{s(50)}$ (MPa)



I:\Users\jmb\Documents\A66\A66_NTP\A66_NTP_201921.gpj RevP1.1 (S0 - Work in progress)
 Database: c:\users\jmb\Documents\A66\A66_NTP\A66_NTP_201921.gpj RevP1.1 (S0 - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Sandstone (RK-Sdst)
- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- ▼ BH BB007
- ⊠ BH BB008
- BH BB009
- ⊙ BH BB010
- ◆ BH BB011
- ⊞ BH BB012
- ⊕ BH BB018
- ⊞ BH BB020
- ⊙ BH BB023
- ⊞ BH BB024
- BH BB003

ARUP

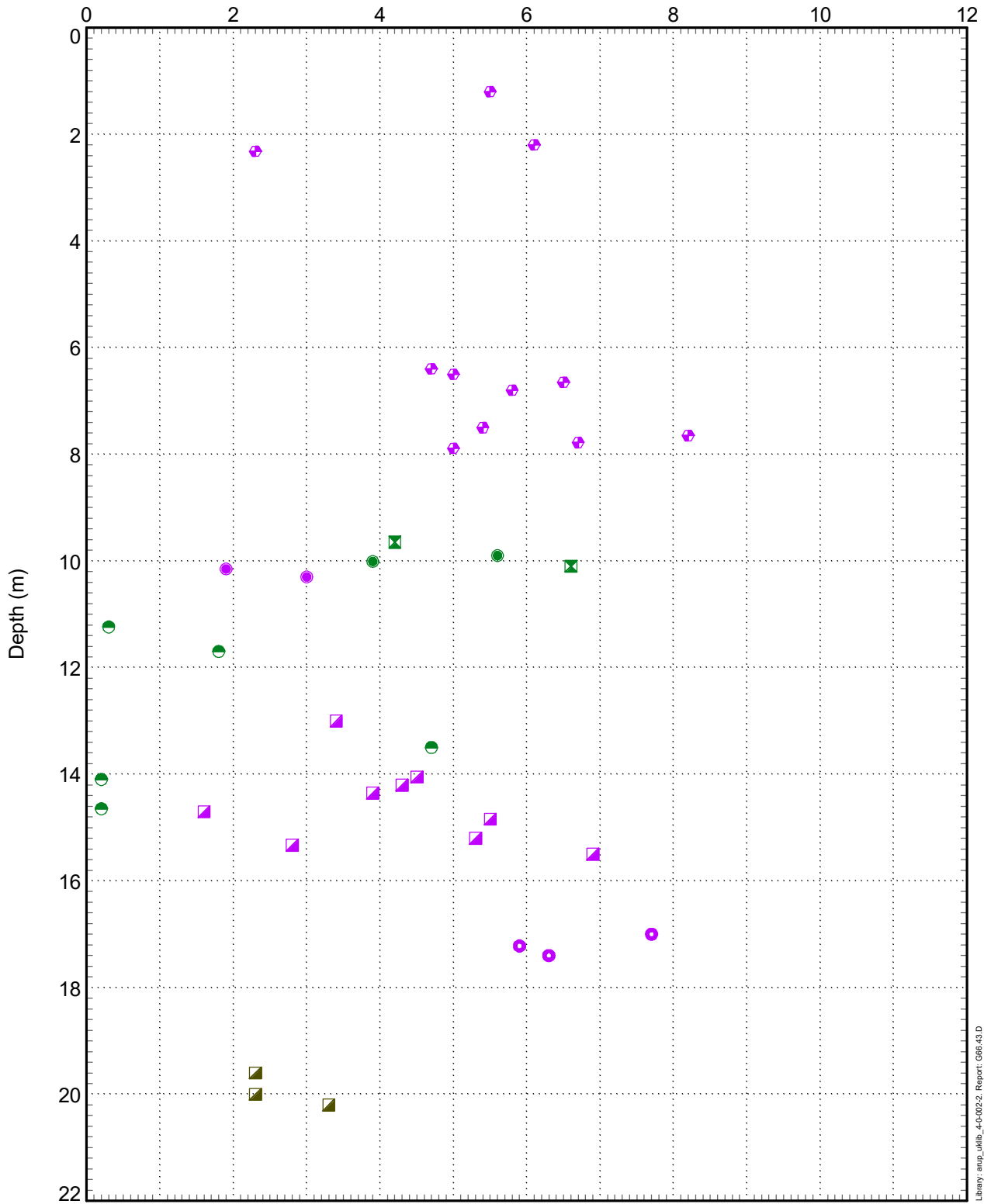
Job Title
A66 NTP

Figure Title
**Point load index (size corrected)
Axial tests**

Job No
276821

Figure No
S7-19a

Point load index (size corrected), $I_{s(50)}$ (MPa)



I:\projects\ntp\A66\A66_210921.gpj RevP1.1 (S0 - Work in progress)
 Database: c:\users\jamie.belkin\desktop\pl66

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 18-Nov-21

- Sandstone (RK-Sdst)
- Mudstone (RK-Mdst)
- ◆ Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- X BH BB008
- BH BB009
- + BH BB018
- + BH BB023
- BH BB024
- BH BB003

ARUP

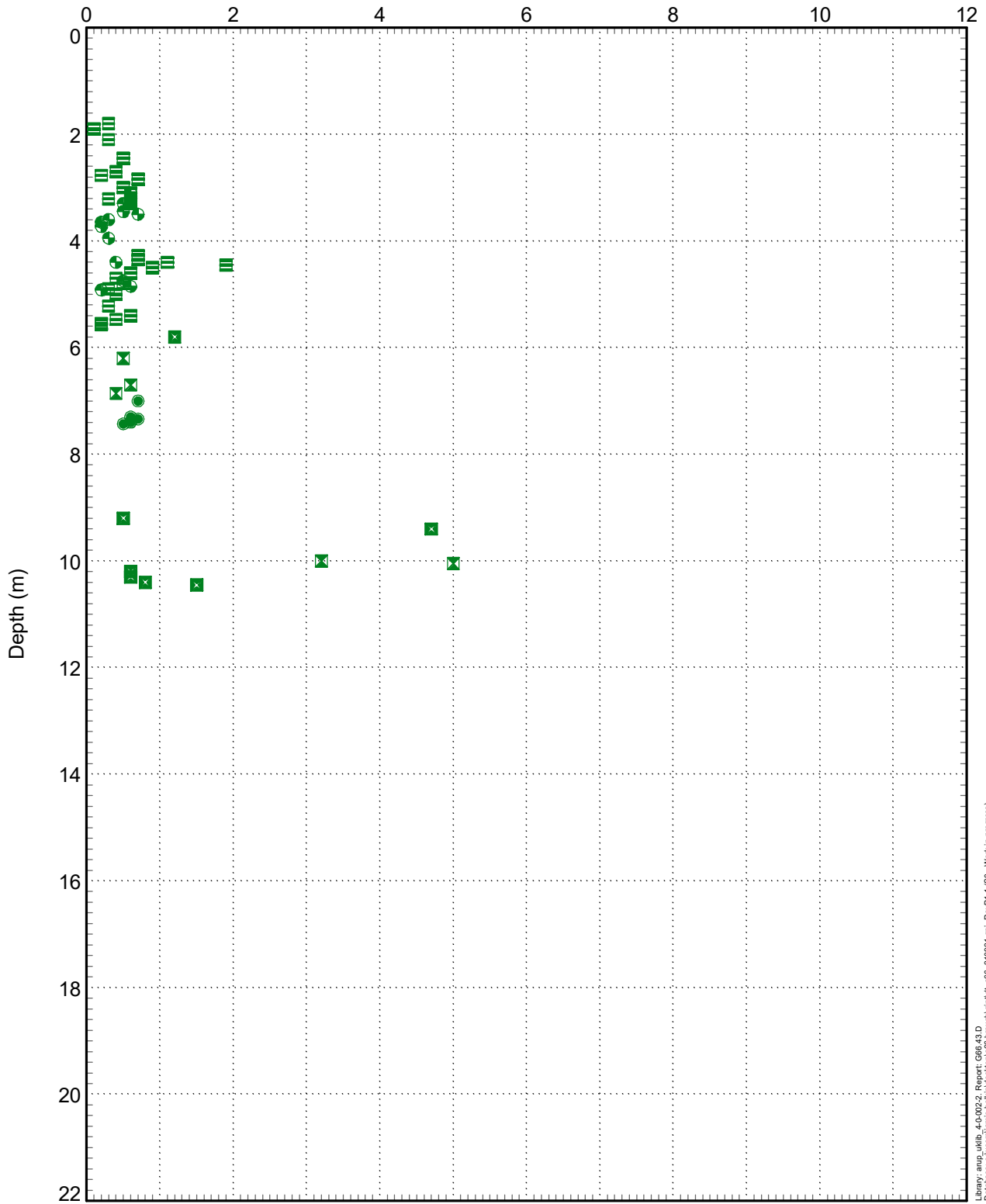
Job Title
A66 NTP

Figure Title
Point load index (size corrected)
Diametral tests

Job No
276821

Figure No
S7-19b

Point load index (size corrected), $I_{s(50)}$ (MPa)



\\arsys-fs01\fs01\lib_4\0_002_2_Report_CSG\A66 Database:c:\users\jamie.belkin\desktop\A66_ through\mtd_ a66_210921.gpj RevP1.1 (S0 - Work in progress)

- Mudstone (RK-Mdst)
- ⊠ BH BB008
- BH BB009
- ⊙ BH BB010
- ▨ BH BB012
- ⊠ BH BB020

ARUP

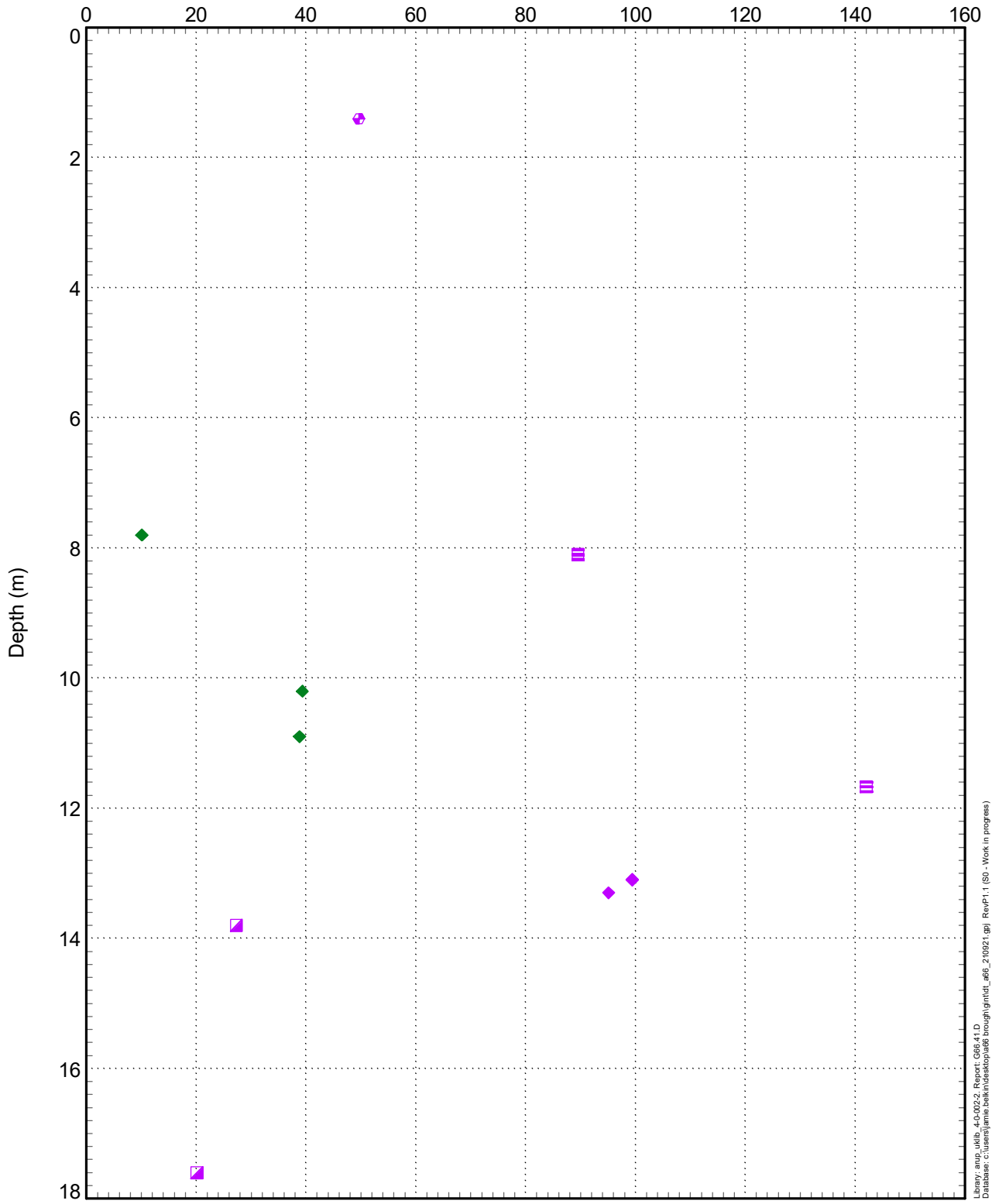
Job Title
A66 NTP

Figure Title
Point load index (size corrected)
Irregular lump tests

Job No
276821

Figure No
S7-19c

Uniaxial (unconfined) compressive strength, σ_c (MPa)



Library path: \\fs1-40-002-2-Project-C66-41-D-Database:c:\users\jamie.belkin\desktop\p066_brough\gim\dat_a66_210821.gpj RevP1.1 (S0 - Work in progress)

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- ◆ BH BB011
- BH BB012
- ⊕ BH BB018
- BH BB024

ARUP

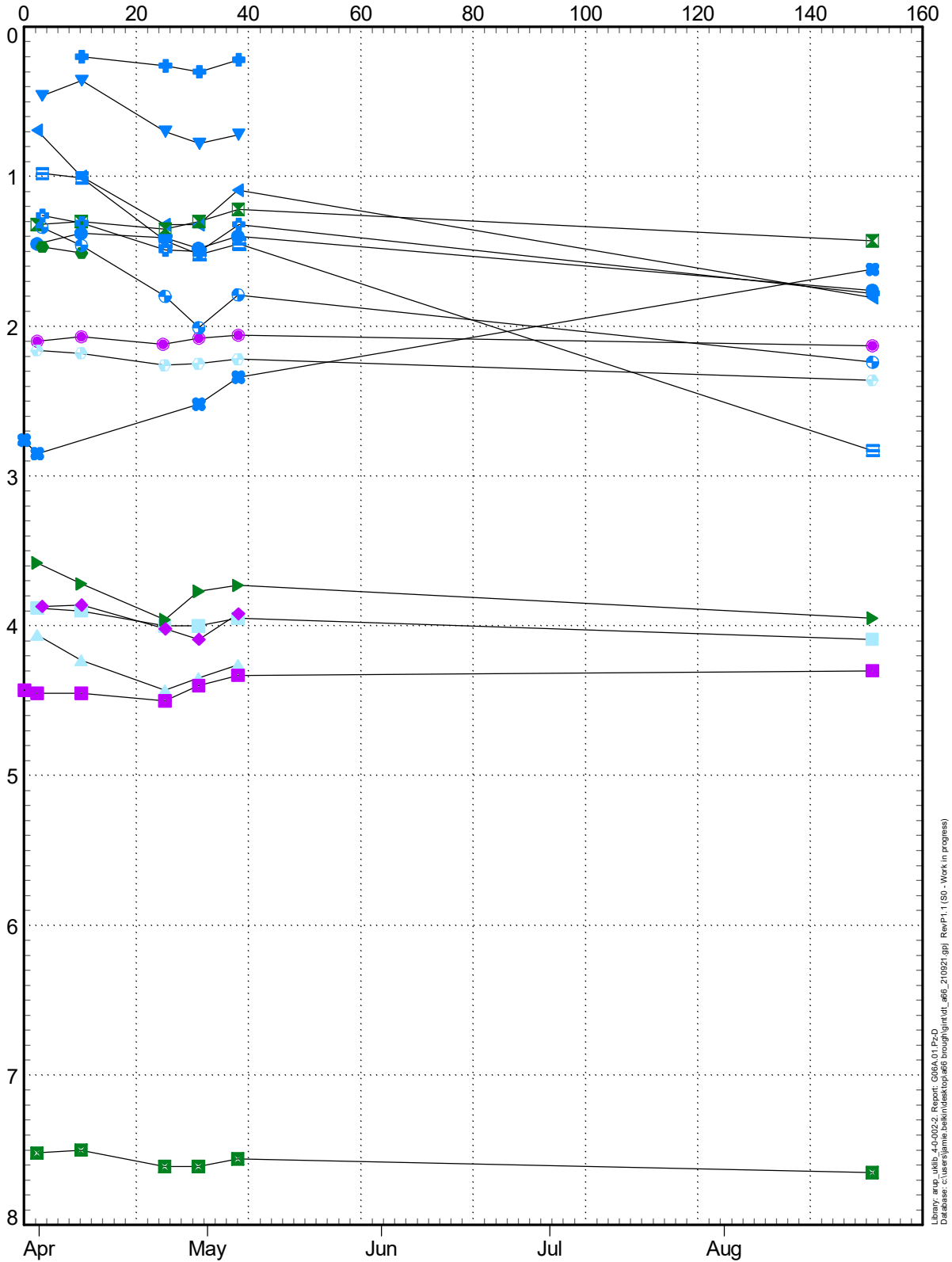
Job Title
A66 NTP

Figure Title
Uniaxial compressive strength

Job No
276821

Figure No
S7-20

DAYS SINCE 29 MARCH 2021



Library: arup_uklib_4-0-002-2; Report: 006A.01.P2-D
Database: c:\users\jamie.beilkin\desktop\ab6_brought\gint\of_lab_210921.gpj RevP1.1 (SO - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Beilkin on 18-Nov-21

- Mudstone (RK-Mdst)
- Limestone (RK-Lst)
- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- BH BB004 @ 4.50m
- BH BB005 @ 5.00m
- ▲ BH BB006 @ 5.00m
- BH BB013 @ 4.00m
- BH BB015 @ 2.00m
- ▼ BH BB022 @ 3.00m
- BH BB025 @ 2.00m
- BH BB007 @ 12.00m
- ▲ BH BB008 @ 2.50m
- ▶ BH BB009 @ 6.50m
- BH BB011 @ 4.00m
- BH BB012 @ 8.00m
- BH BB014 @ 3.00m
- ◆ BH BB018 @ 4.50m
- BH BB023 @ 6.00m
- BH BB024 @ 2.00m
- BH BB002 @ 4.30m
- BH BB003 @ 11.00m

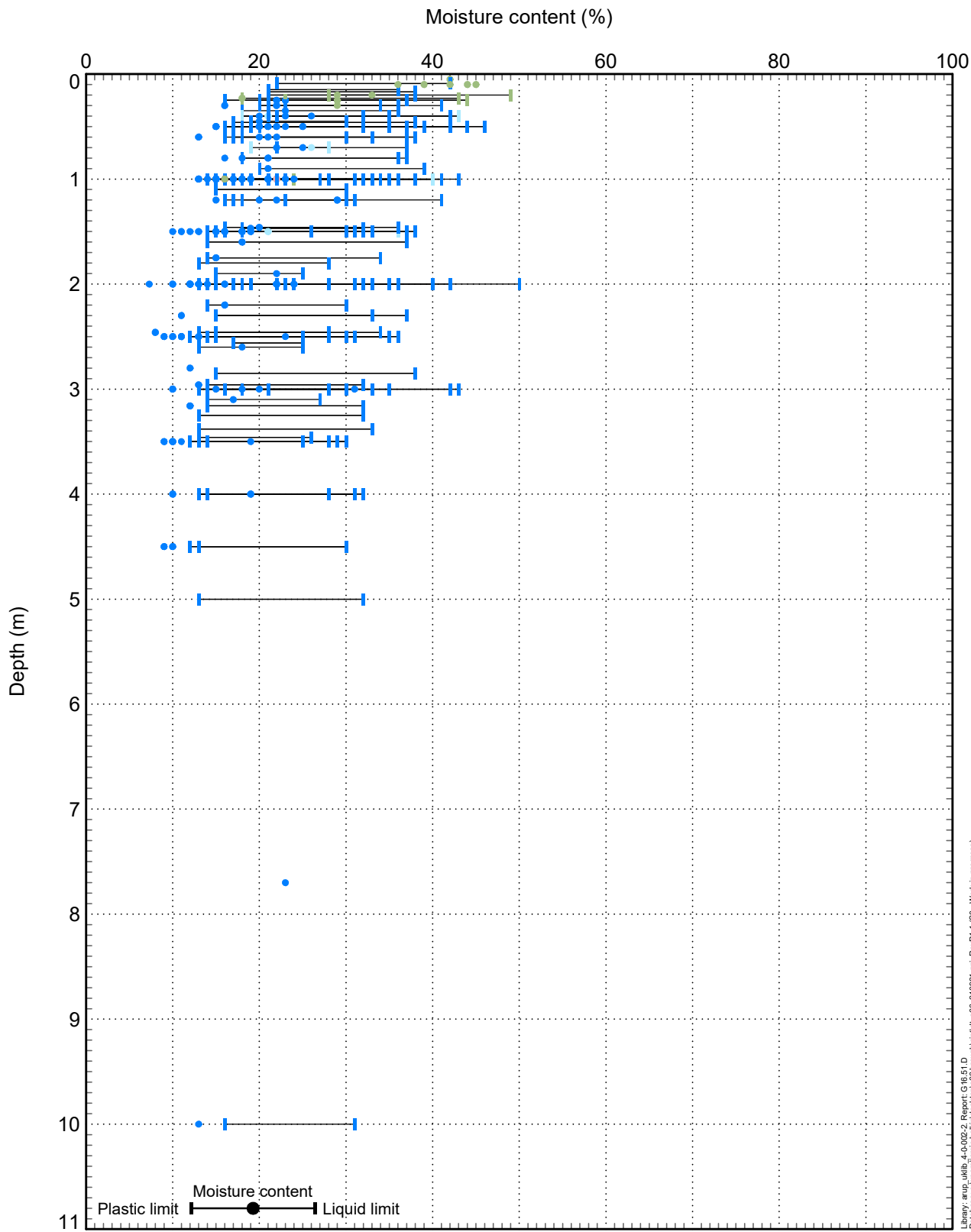
ARUP

Job Title
A66 NTP

Figure Title
Piezometric data vs time

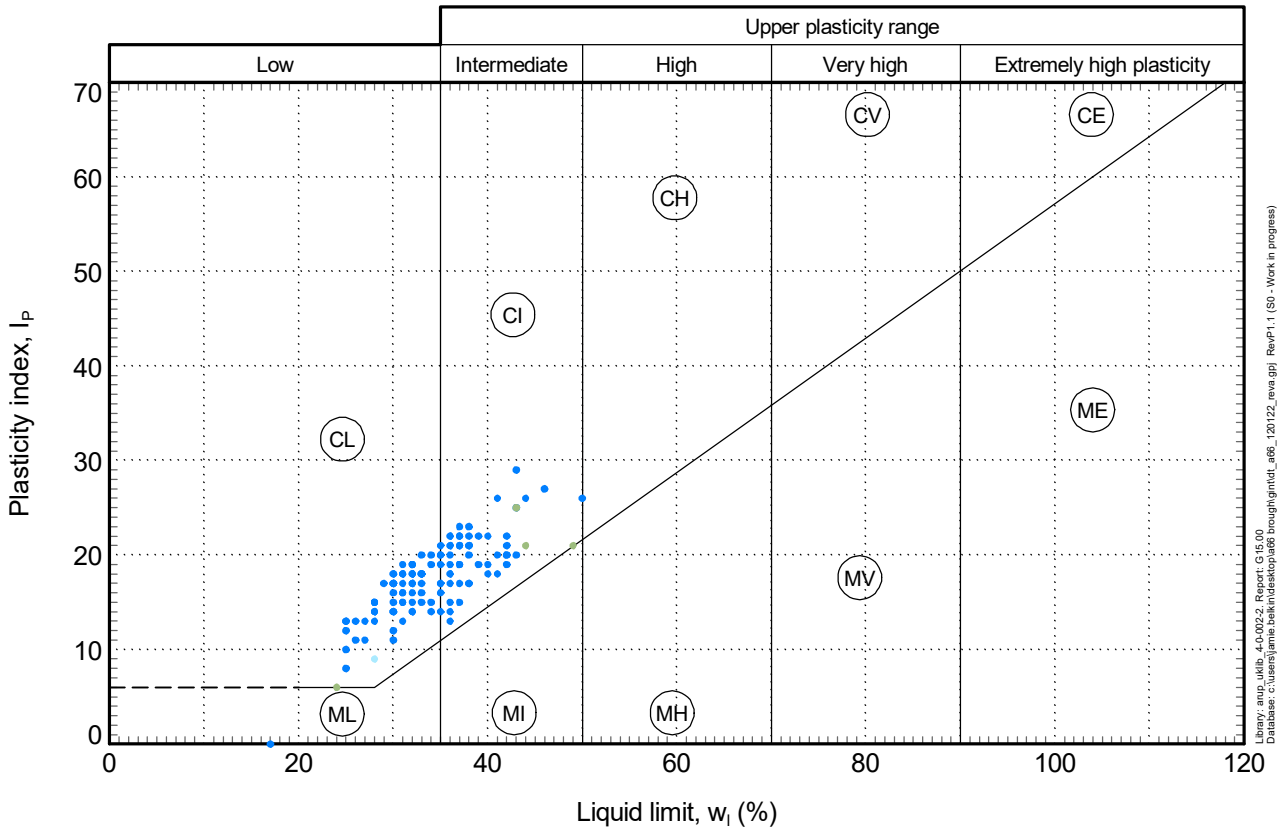
Job No
276821

Figure No
S7-21



I:\Users\james.belkin\Documents\A66\A66_NTP\A66_NTP_1.1 (SO - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21



Library: \\ntb\... 4.0.002.0; Report: S16.00
Database: c:\user\jama.beek\ndesktop\A66 through\mid..._a66_120122_rev1.gpj Rev:P1.1 (SO - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)

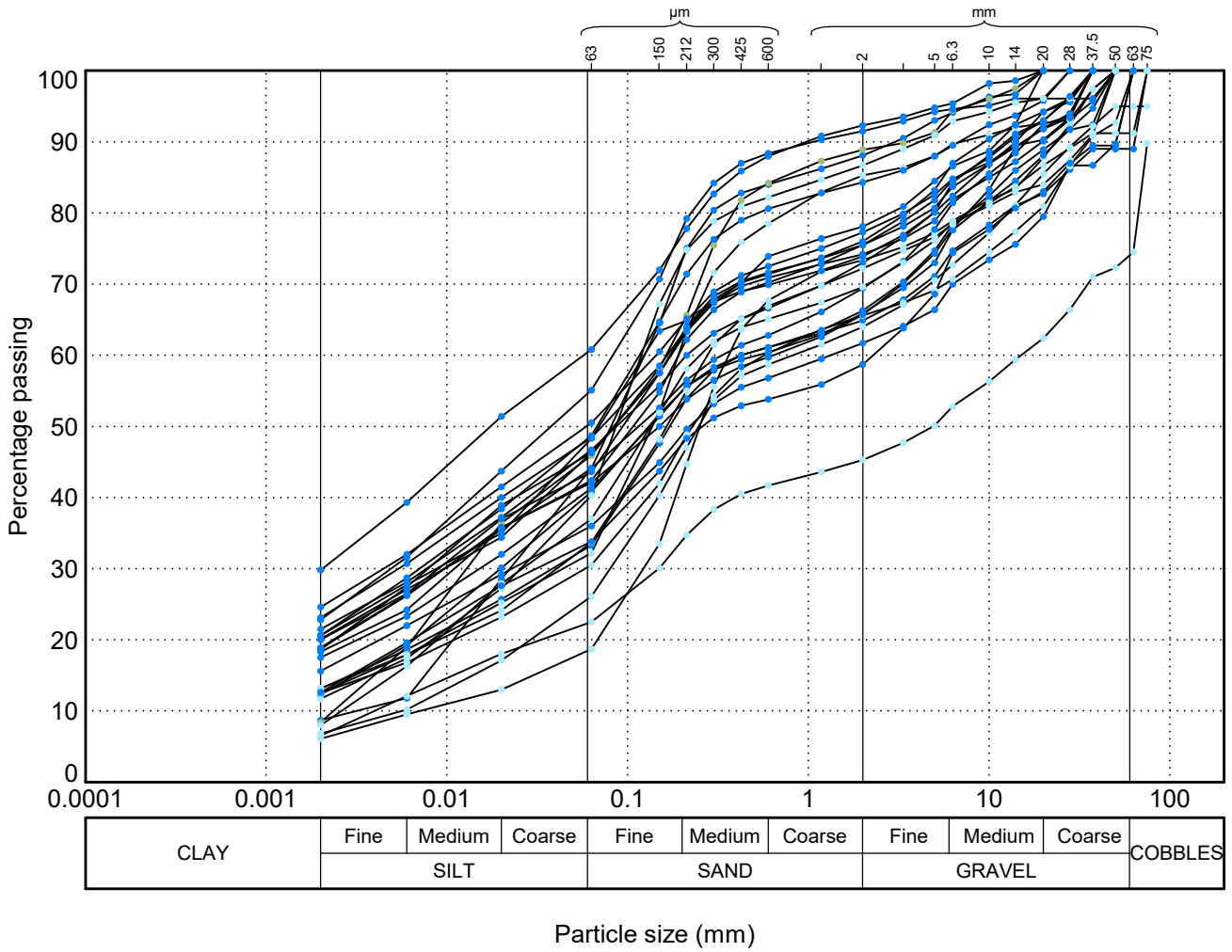
ARUP

Job Title
A66 NTP

Figure Title
Plasticity chart

Job No
276821

Figure No
S8-2



Library: arup_wdhl_4-0-002-2_Report: G10A.00
 Database: C:\users\jamie.belkin\desktop\ab6_210821.gpj Rev:P1:1 (SO - Work in progress)

1,00

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- Topsoil (TOP)

ARUP

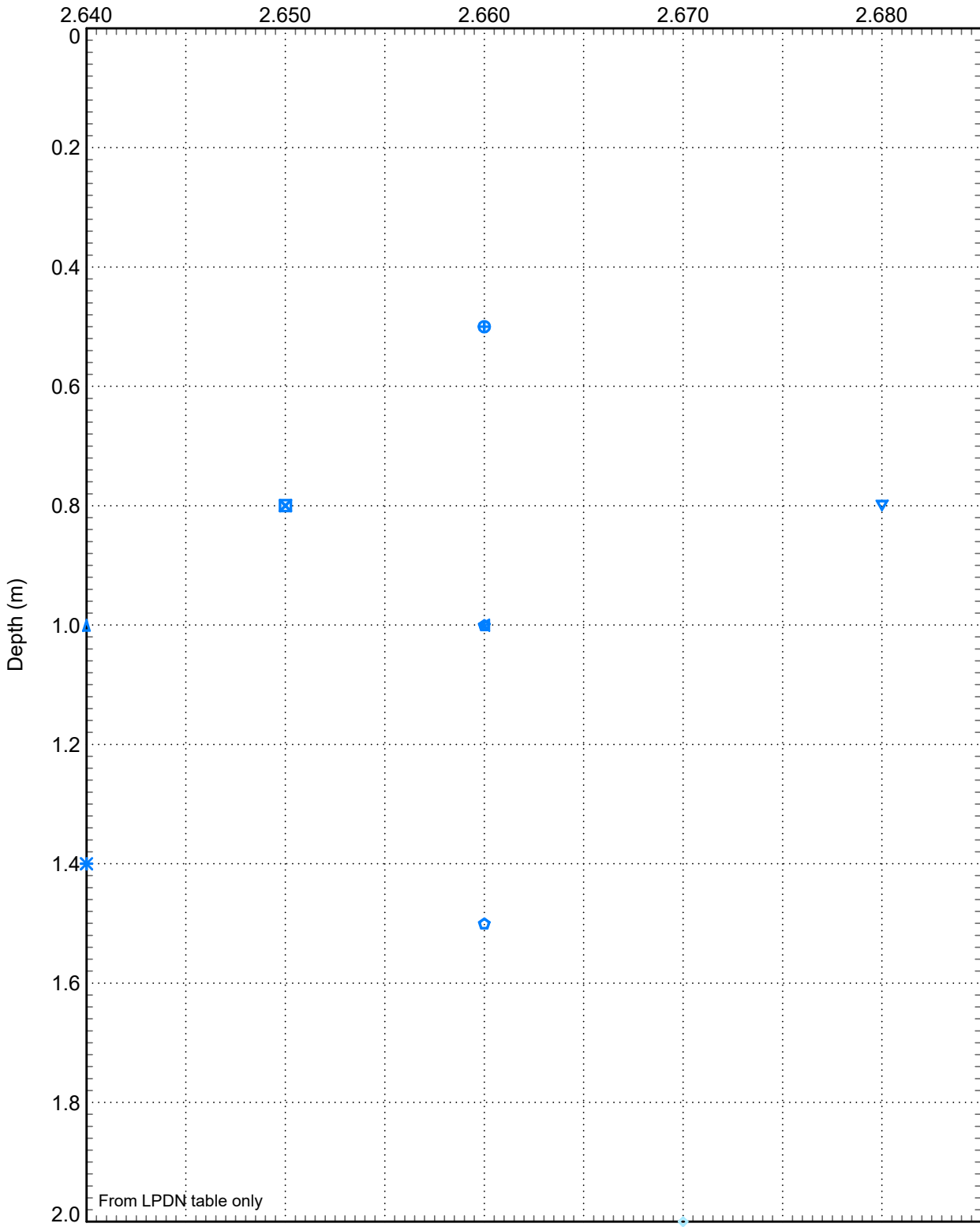
Job Title
A66 NTP

Figure Title
Particle size distribution

Job No
276821

Figure No
S8-3

Particle density, ρ_s (Mg/m³)



I:\Users\jmb\p\A66\002-2_Report\GIB_R4.D
 Database: c:\users\jmb\p\A66\002-2\Report\GIB_R4.D

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- ⊕ TP CLR002
- ▼ TP CLR002A
- * TP CLR004
- ▲ TP CLR005
- TP CLR007
- ◇ TP CLR008
- ▲ TP CLR009
- ◆ TP CLR013
- ◇ TP CLR020

ARUP

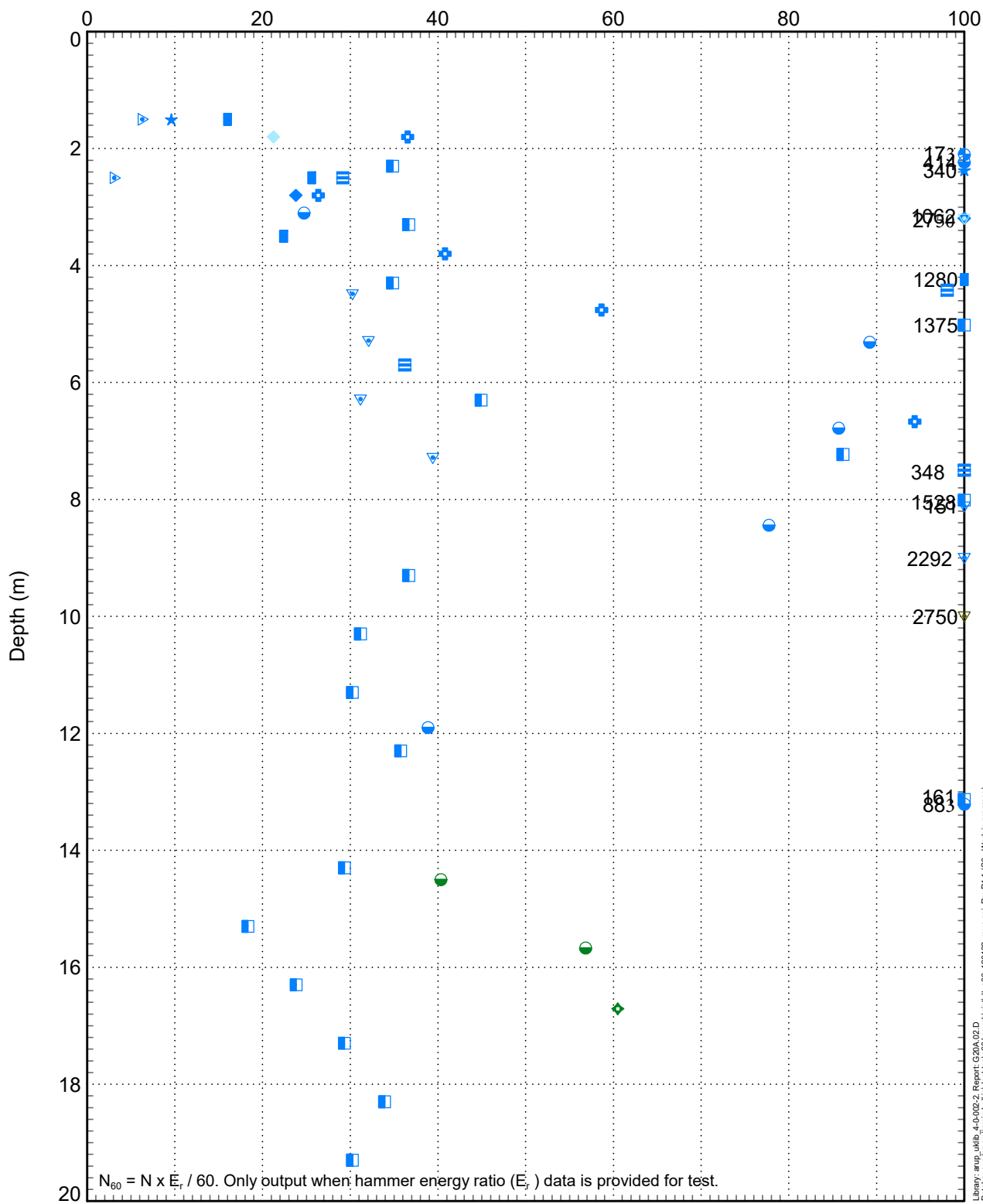
Job Title
A66 NTP

Figure Title
Particle density

Job No
276821

Figure No
S8-4

SPT N(60) value, N_{60}



I:\base\proj\A66\02-2_Report\CD\A66_02.D
 Database: c:\users\jamie.belkin\desktop\A66_brought\mtdat_a66_120122_rev.aop\ Rev:P1.1 (SO - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 8-Feb-22

- Sandstone (RK-Sdst)
- Mudstone (RK-Mdst)
- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- ⊕ BH CLR001
- ◆ BH CLR004
- ▨ BH CLR010
- ⊕ BH CLR011
- BH CLR003
- ▽ WS CLR001
- WS CLR003
- ★ WS CLR005
- BH CLR001A
- ◆ BH CLR003A
- ▽ BH CLR004A

ARUP

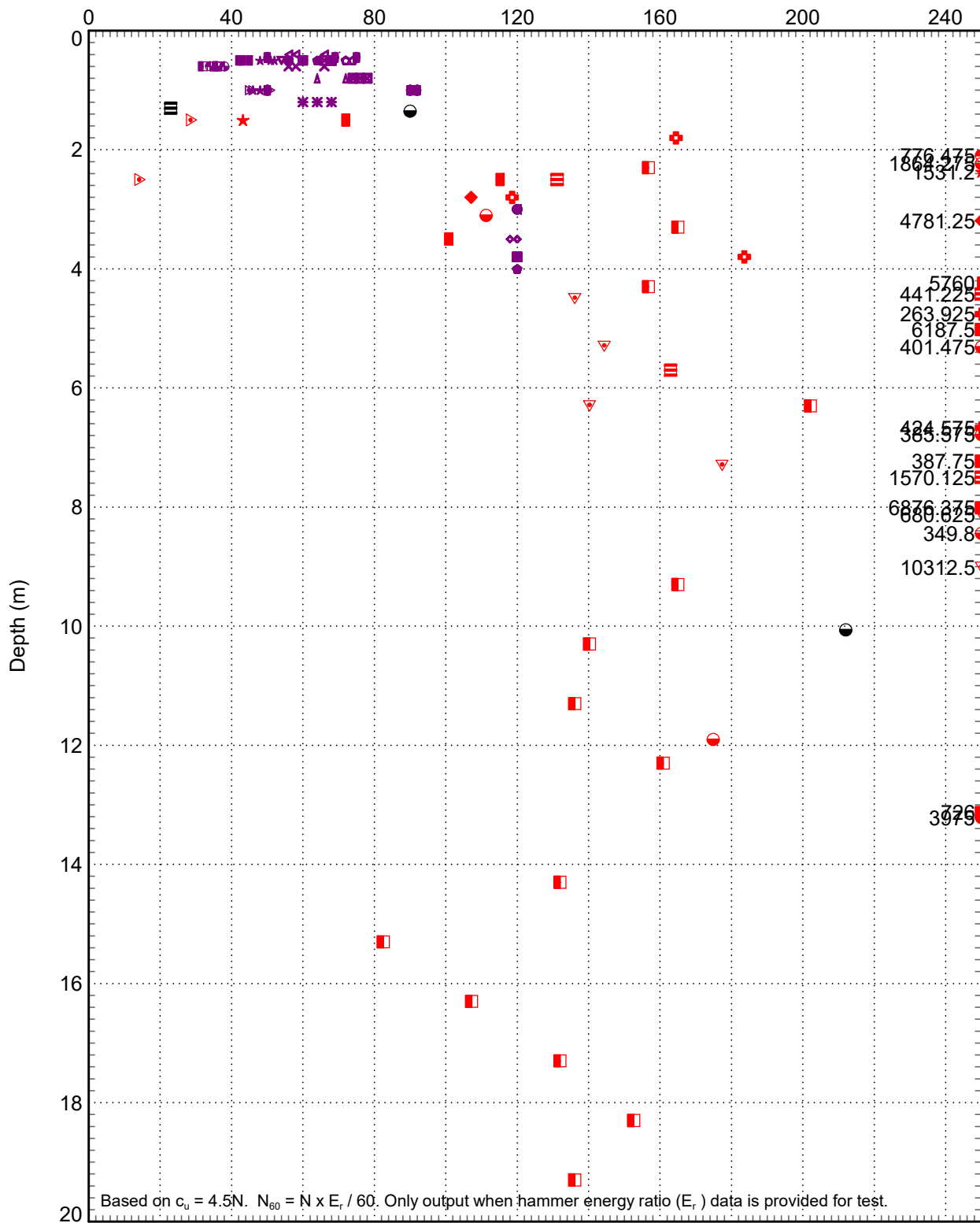
Job Title
A66 NTP

Figure Title
Standard penetration tests

Job No
276821

Figure No
S8-5

Undrained shear strength, c_u (kPa)



I:\Users\jmb\p\A66\2012\01\Revised_C31_20x12\01.D
 Database: c:\users\jmb\p\A66\2012\01\Revised_C31_20x12\01.d\eva\api\RevP1.1 (SO - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 22-Feb-22

- | | |
|-------------------------|--------------|
| ■ cu from SPT (x4.5) | ▲ TP CLR004 |
| ■ From hand vane (peak) | ▣ TP CLR006 |
| ■ From triaxial test | △ TP CLR007 |
| ● BH CLR001 | ▲ TP CLR008 |
| ◆ BH CLR004 | ✕ TP CLR009A |
| ▣ BH CLR010 | ● TP CLR012 |
| ⊕ BH CLR011 | ◆ TP CLR015 |
| ● BH CLR003 | ■ TP CLR020 |
| ▽ WS CLR001 | ■ BH CLR001A |
| ■ WS CLR003 | ▽ BH CLR004A |
| ★ WS CLR005 | |
| ⊕ TP CLR001 | |
| △ TP CLR002 | |
| ▣ TP CLR002A | |
| ✱ TP CLR003 | |

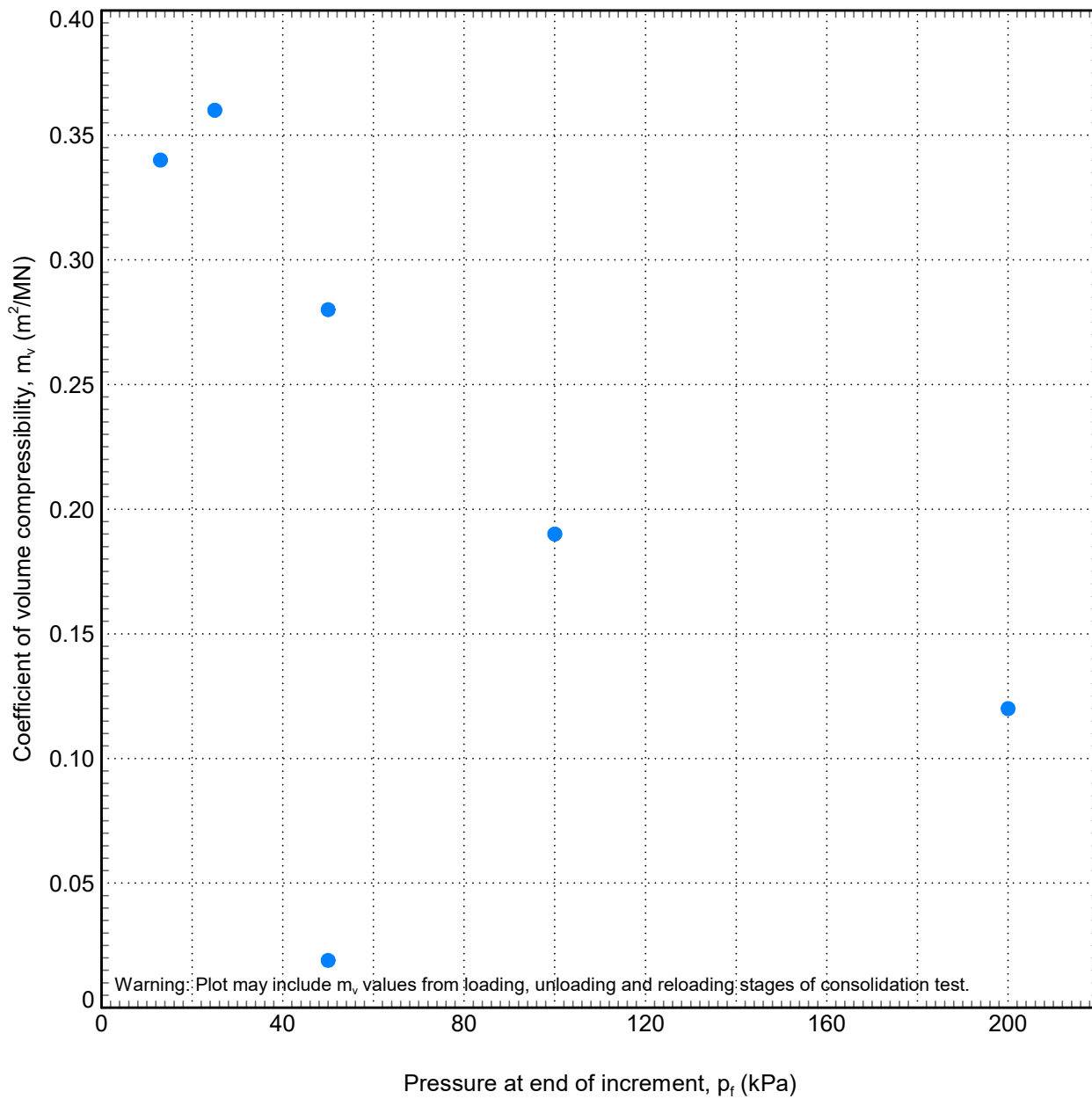
ARUP

Job Title
A66 NTP

Figure Title
**Undrained shear strength
GLACIAL DEPOSITS COHESIVE**

Job No
276821

Figure No
S8-6



Library: arup_wklib_4-0-002-2_Report: G43.12
 Database: C:\Users\jamie.belkin\sketchbook\arup\gint\td_ar6_210921.gpi RevP1.1 (S0 - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- BH CLR003, 1.23m

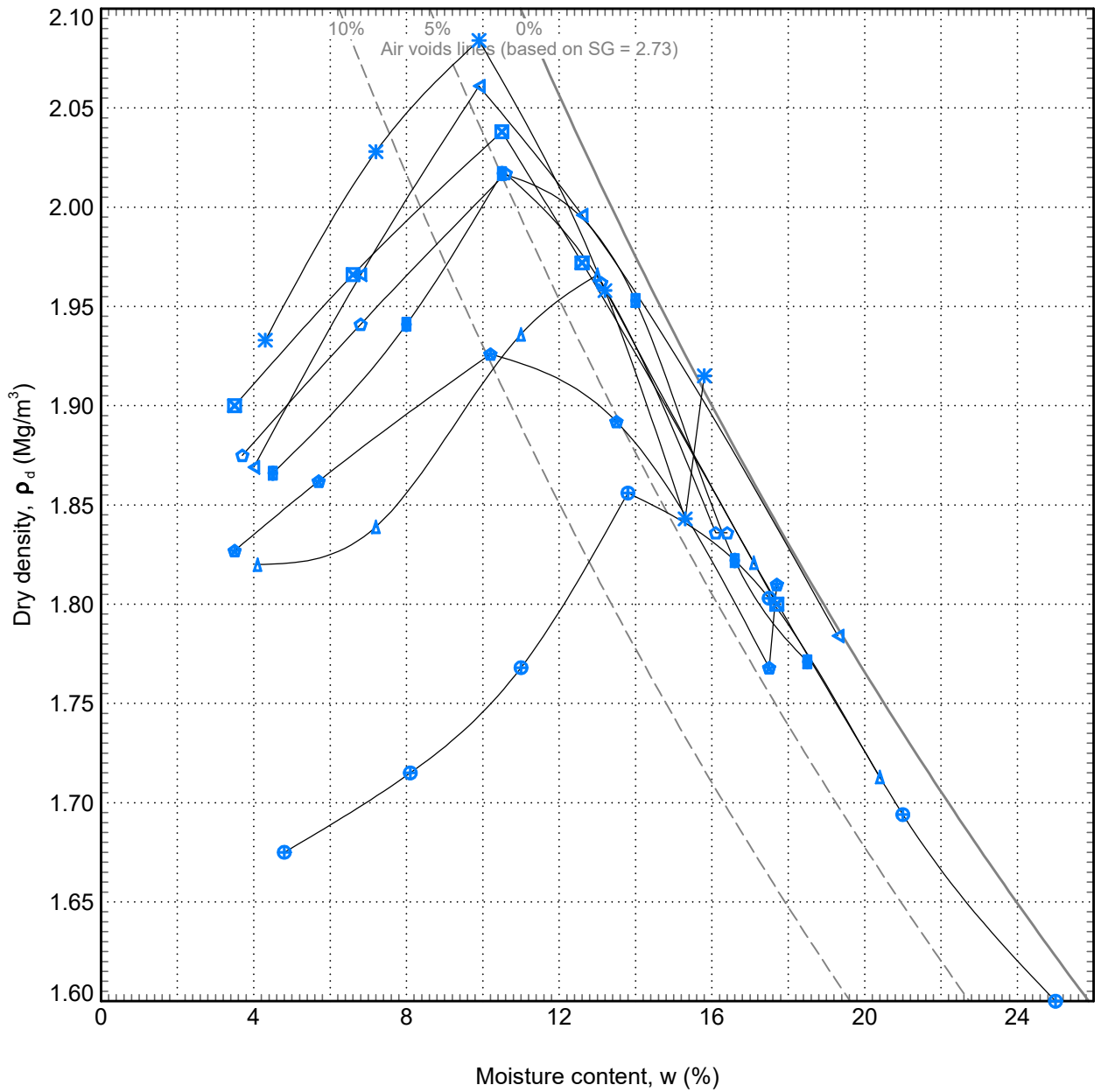
ARUP

Job Title
A66 NTP

Figure Title
Volume compressibility

Job No
276821

Figure No
S8-7



ARUP - gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- ⊕ TP CLR002
- ⊗ TP CLR004
- ⊛ TP CLR005
- ⊠ TP CLR007
- ⊙ TP CLR008
- ⊡ TP CLR009
- ⊔ TP CLR013
- TP CLR023

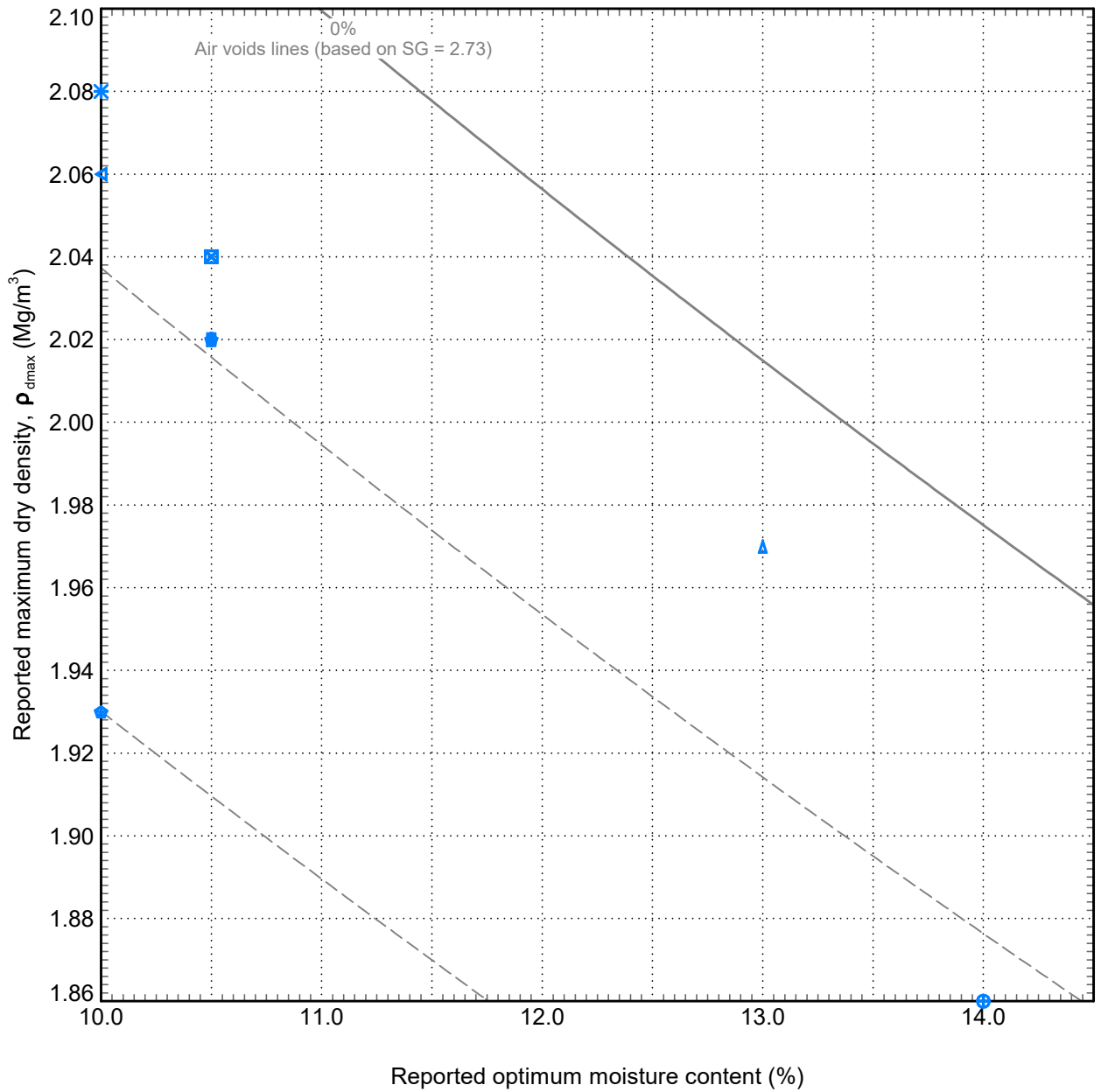
ARUP

Job Title
A66 NTP

Figure Title
Compaction tests

Job No
276821

Figure No
S8-8



Library: arup_wklib_4-0-002-2_Report_G51.00
 Database: C:\Users\jamie.belkin\skopad6\brough\gint\td_ar6_210921.gpi RevP1.1 (S0 - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- ⊕ TP CLR002
- ✱ TP CLR004
- ▲ TP CLR005
- ⊠ TP CLR007
- TP CLR008
- ▲ TP CLR009
- TP CLR013
- TP CLR023

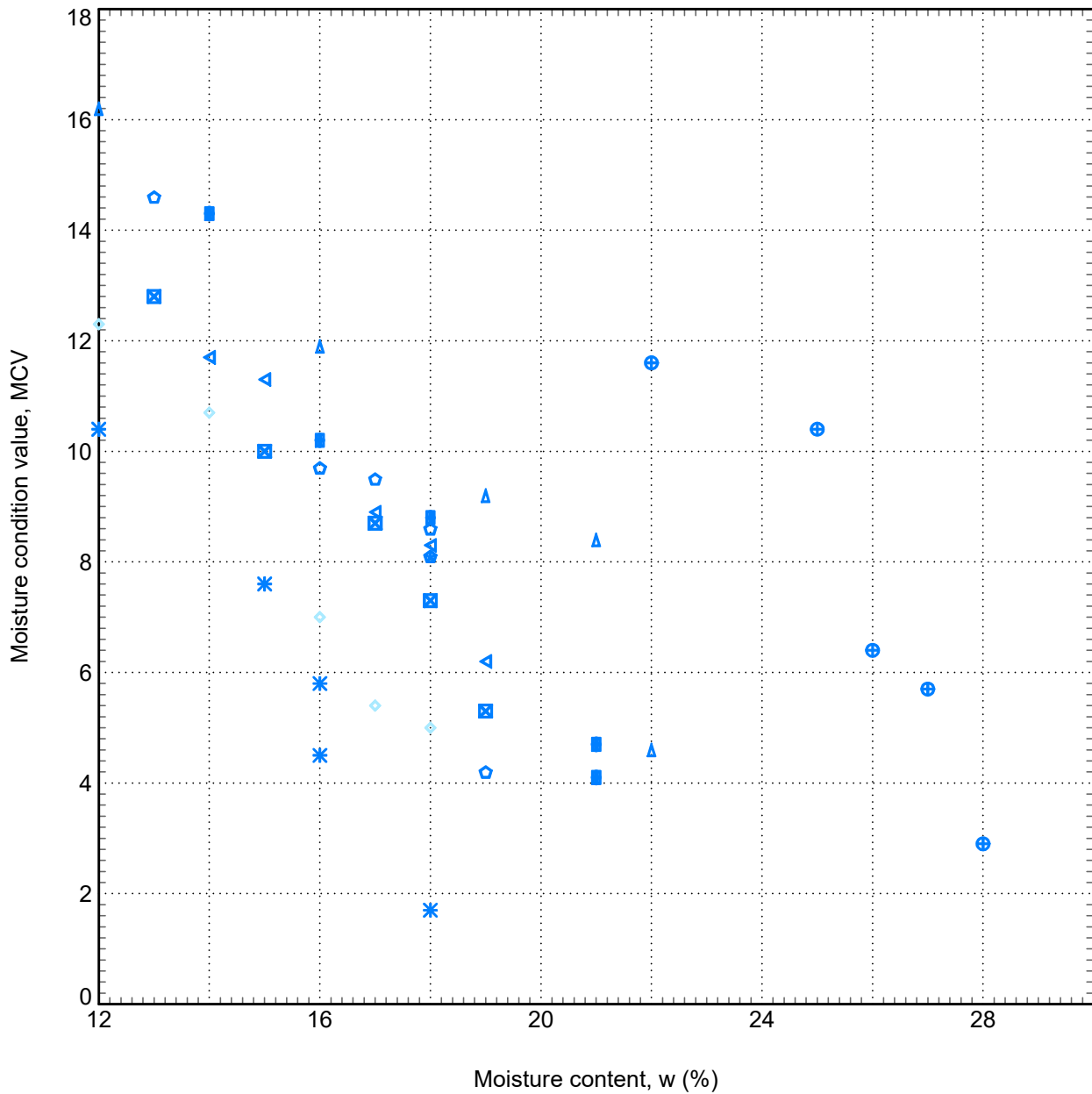
ARUP

Job Title
A66 NTP

Figure Title
OMC and maximum dry density

Job No
276821

Figure No
S8-9



Library: arup, v10.00.01.07, Made by: Jamie Belkin on 5-Oct-21
 Database: C:\users\jamie.belkin\desktop\p466_brough\mtdat_a66_210821.gpr RevP1.1 (S0 - Work in progress)

ARUP_gINT v10.00.01.07, Made by: Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- ⊕ TP CLR002
- * TP CLR004
- ▲ TP CLR005
- ⊠ TP CLR007
- ◇ TP CLR008
- ▲ TP CLR009
- ⊕ TP CLR013
- ◇ TP CLR020
- TP CLR023

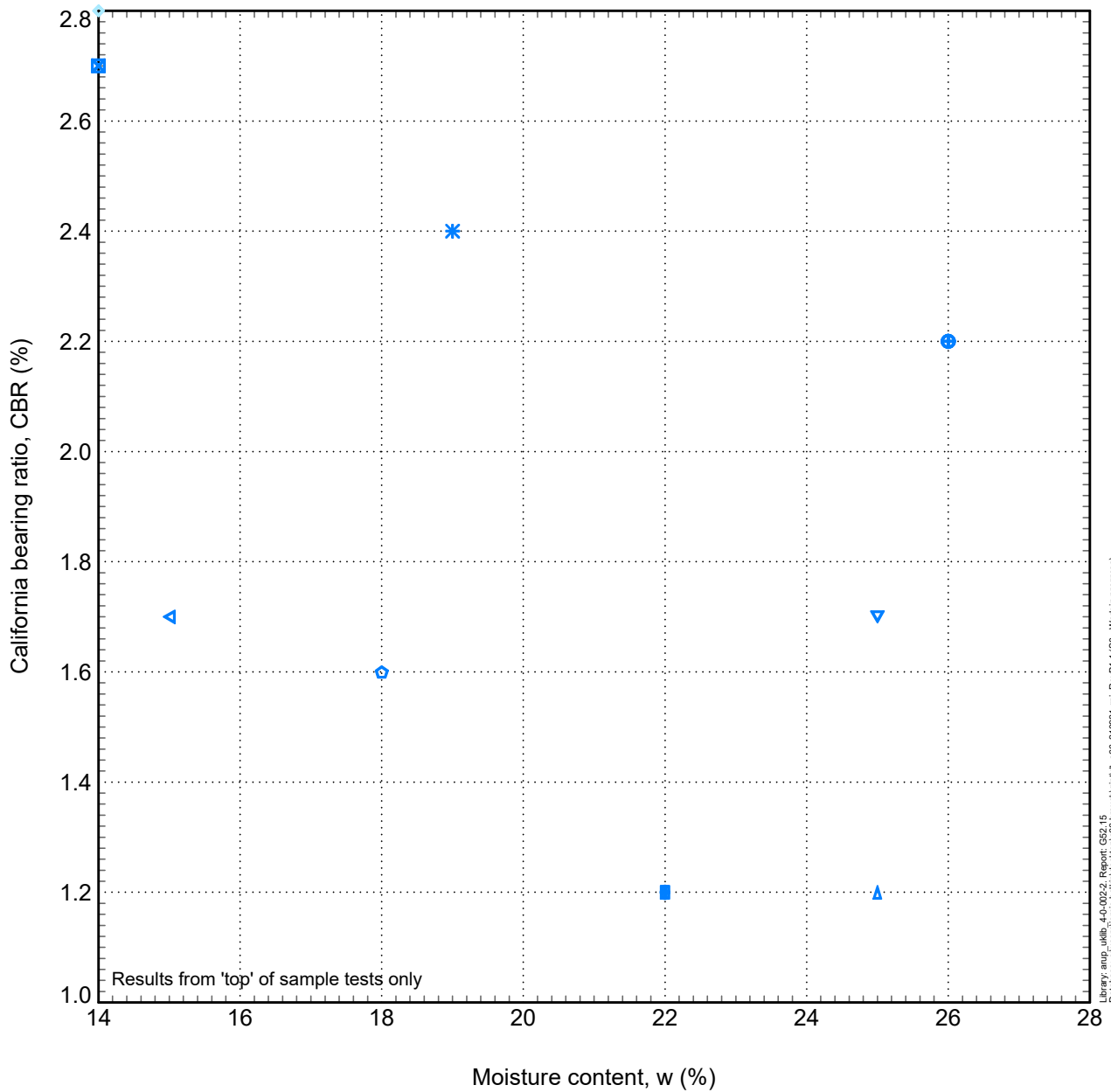
ARUP

Job Title
A66 NTP

Figure Title
MCV vs moisture content

Job No
276821

Figure No
S8-10



Library path: \\s0-0023-2-Research-CBR-15
 Database: C:\Users\jamie.belkin\desktop\A66_brought_in\cal_a66_210821.gpr RevP1.1 (S0 - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- ⊕ TP CLR002
- ◀ TP CLR002A
- * TP CLR004
- ▲ TP CLR005
- ▣ TP CLR007
- ⊙ TP CLR008
- ▲ TP CLR009
- ◊ TP CLR020
- TP CLR023

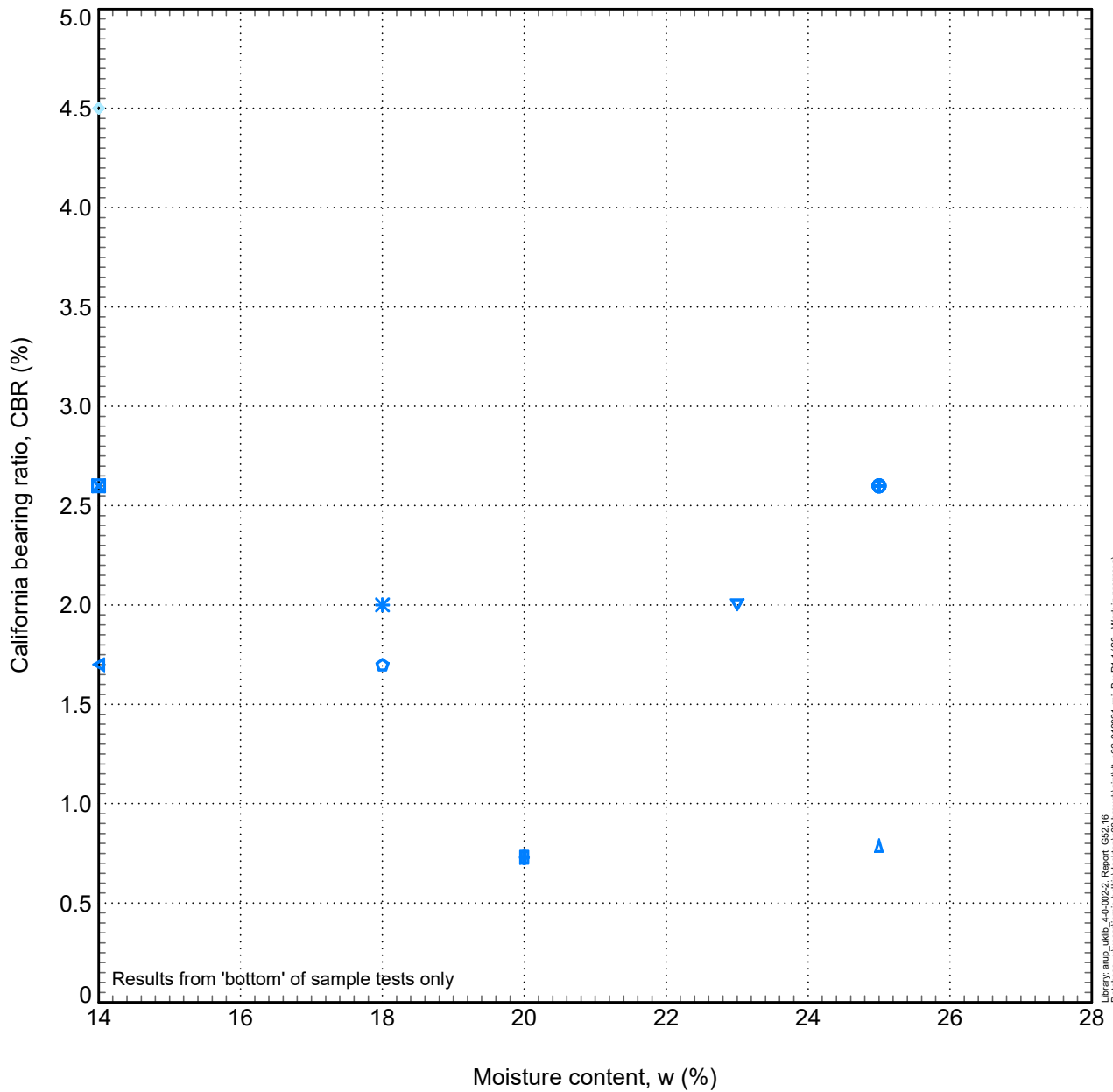
ARUP

Job Title
A66 NTP

Figure Title
Lab CBR vs moisture content

Job No
276821

Figure No
S8-11



Library: arup_v10.00.01.07; Rev: 4.0.002.2; Report: CBR_16
 Database: C:\users\jamie.belkin\desktop\A66_brough\mtd_a66_210821.gpr | RevP1.1 (S0 - Work in progress)

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- ⊕ TP CLR002
- ▼ TP CLR002A
- * TP CLR004
- ▲ TP CLR005
- TP CLR007
- ⊕ TP CLR008
- ▲ TP CLR009
- ◆ TP CLR020
- TP CLR023

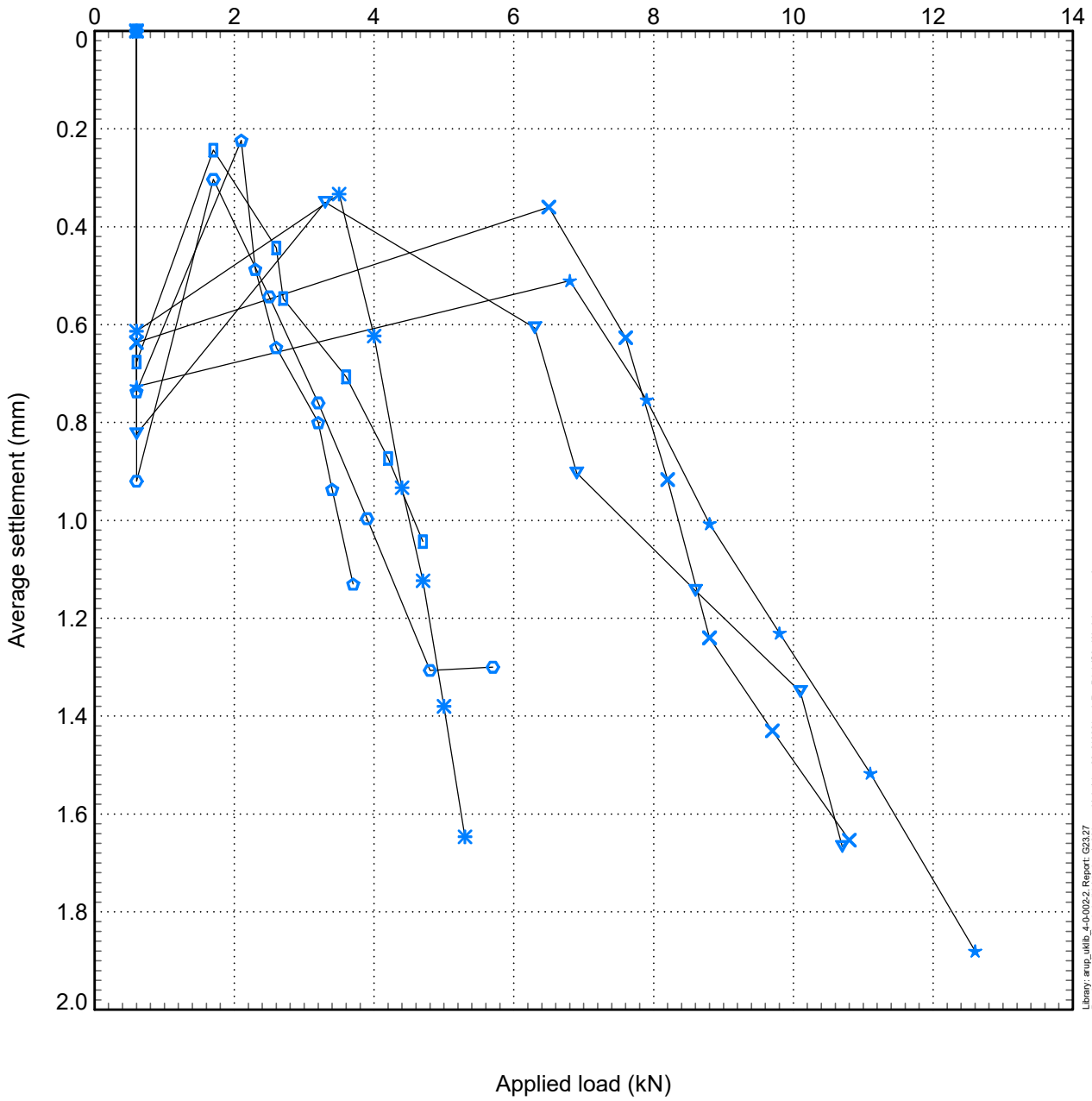
ARUP

Job Title
A66 NTP

Figure Title
Lab CBR vs moisture content

Job No
276821

Figure No
S8-12



Library: \\na\libs\4.0.0022\Revised\62827 Database: c:\users\jamie.belkin\data\plots\66_brough\gnatit_a66_210921.gpi Rev: P1.1 (SD - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- TP CLR001
- ◄ TP CLR002A
- * TP CLR004
- TP CLR006
- ◊ TP CLR008
- ✕ TP CLR010
- ★ TP CLR012

ARUP

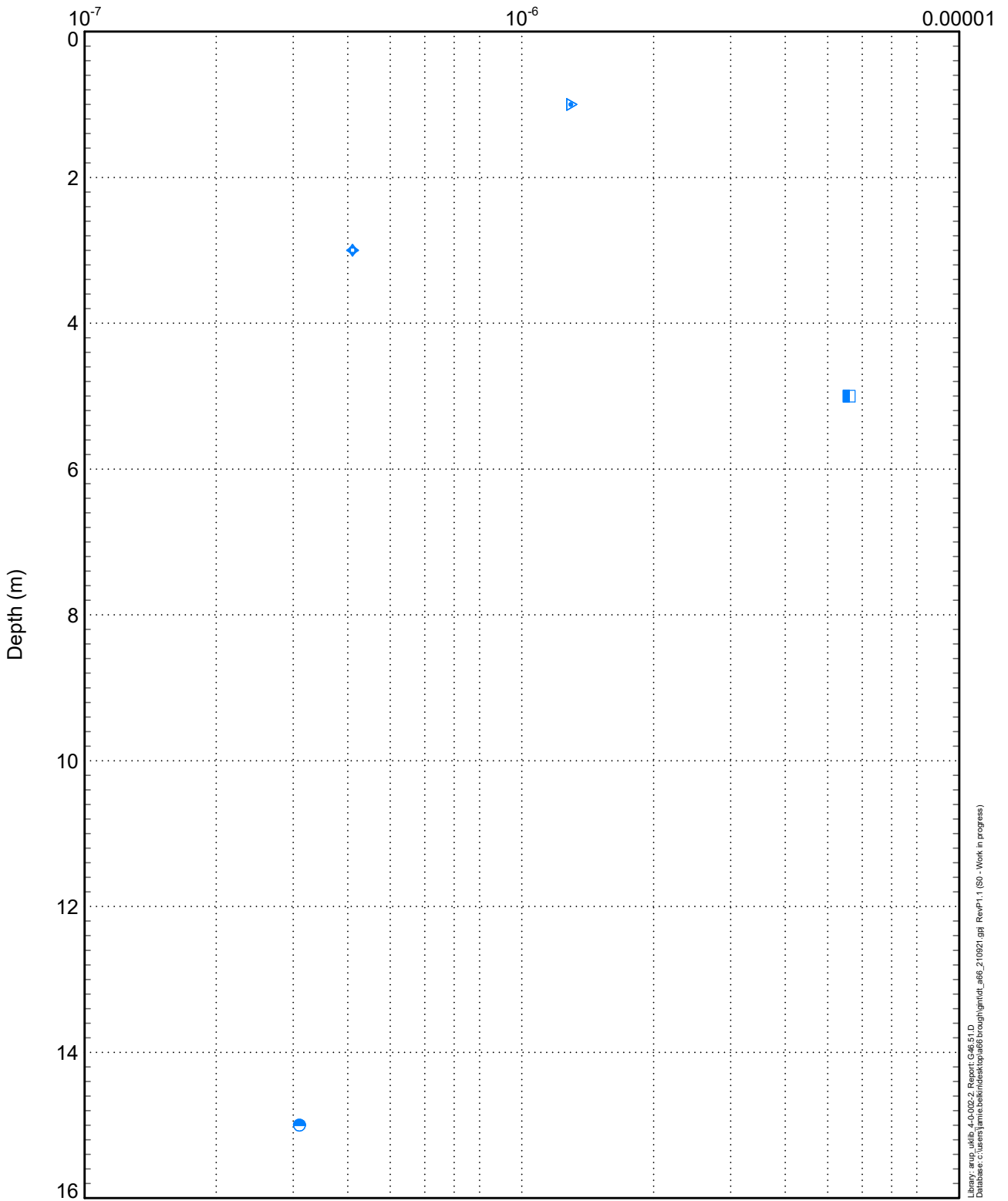
Job Title
A66 NTP

Figure Title
Plate loading tests

Job No
276821

Figure No
S8-13

Permeability, k (m/s)



I:\Users\jamie.belkin\Documents\A66_210921.gpr RevP1.1 (SO - Work in progress)
 Database: c:\users\jamie.belkin\desktop\A66_210921.gpr RevP1.1 (SO - Work in progress)

- Glacial Deposits Cohesive (GD-C)
- ▼ WS CLR003
- BH CLR001A
- BH CLR003A
- ◆ BH CLR004A

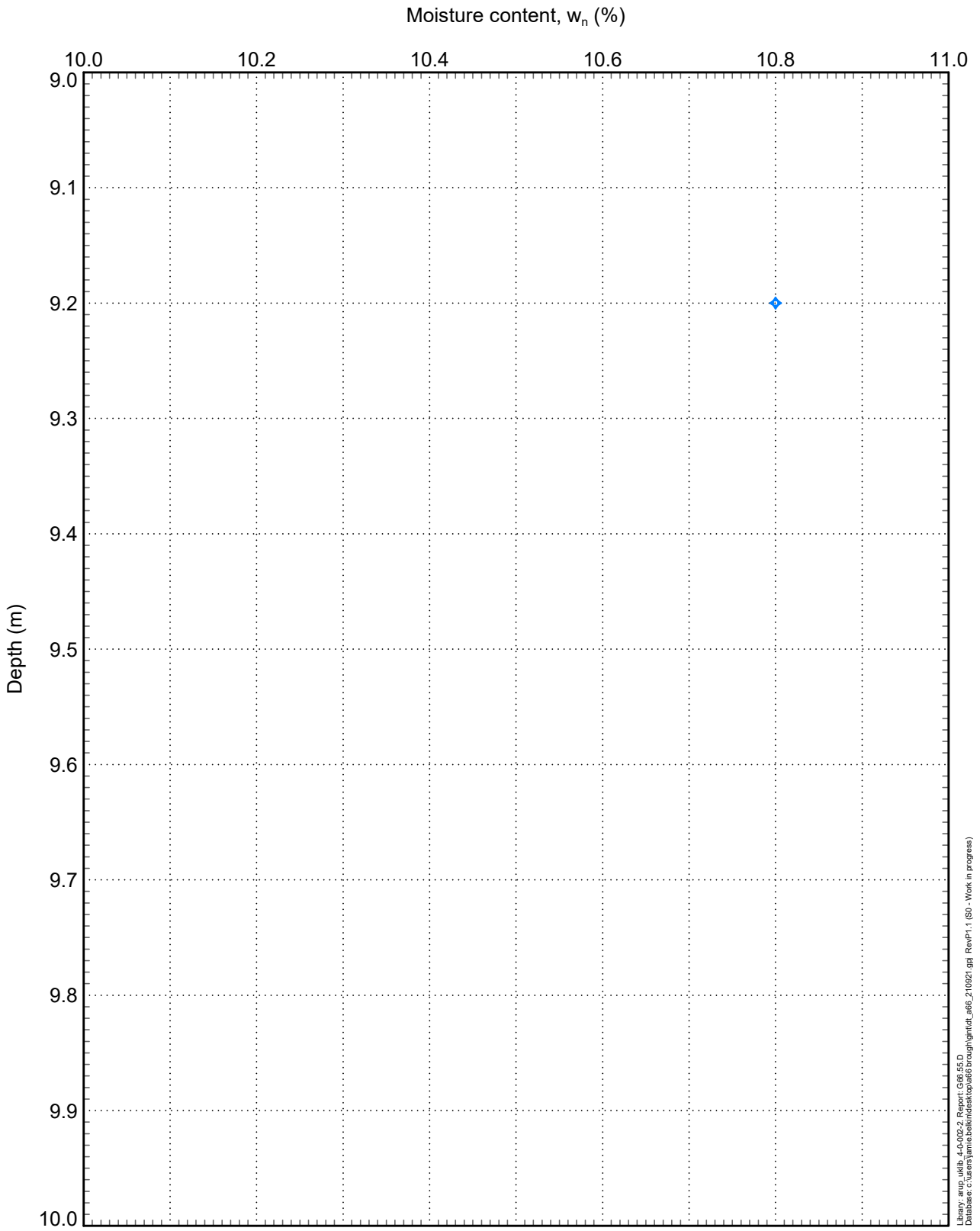
ARUP

Job Title
A66 NTP

Figure Title
In situ permeability

Job No
276821

Figure No
S8-14



I:\Users\jmb\p\A66_210921\2_Report_C66_55.D
 Database: c:\users\jmb\p\A66_210921\2_Report_C66_55.D

- Glacial Deposits Cohesive (GD-C)
- ◆ BH CLR004A

ARUP

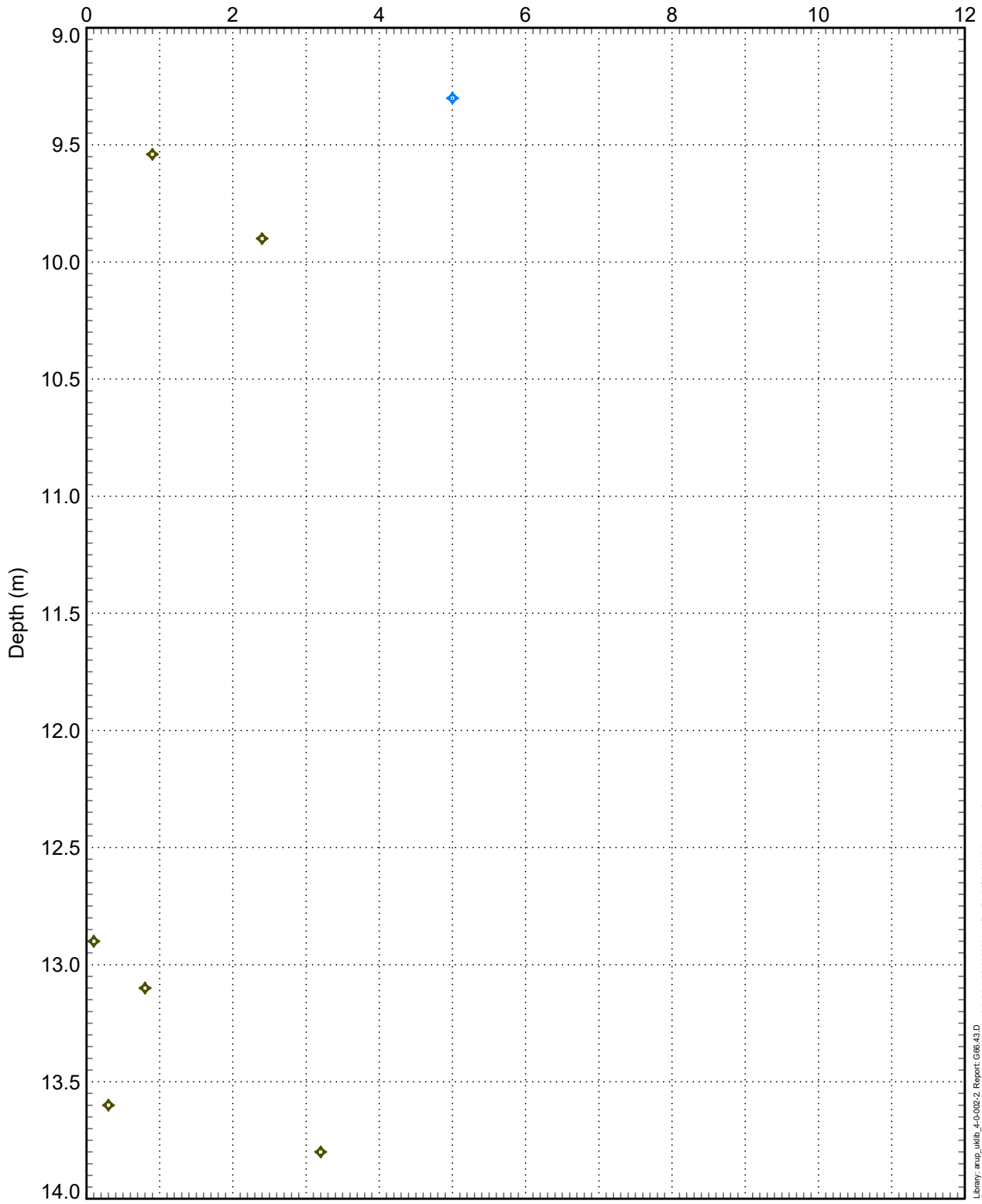
Job Title
A66 NTP

Figure Title
Rock moisture content

Job No
276821

Figure No
S8-15

Point load index (size corrected), $I_{s(50)}$ (MPa)



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ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Sandstone (RK-Sdst)
- Glacial Deposits Cohesive (GD-C)
- ◆ BH CLR004A

ARUP

Job Title
A66 NTP

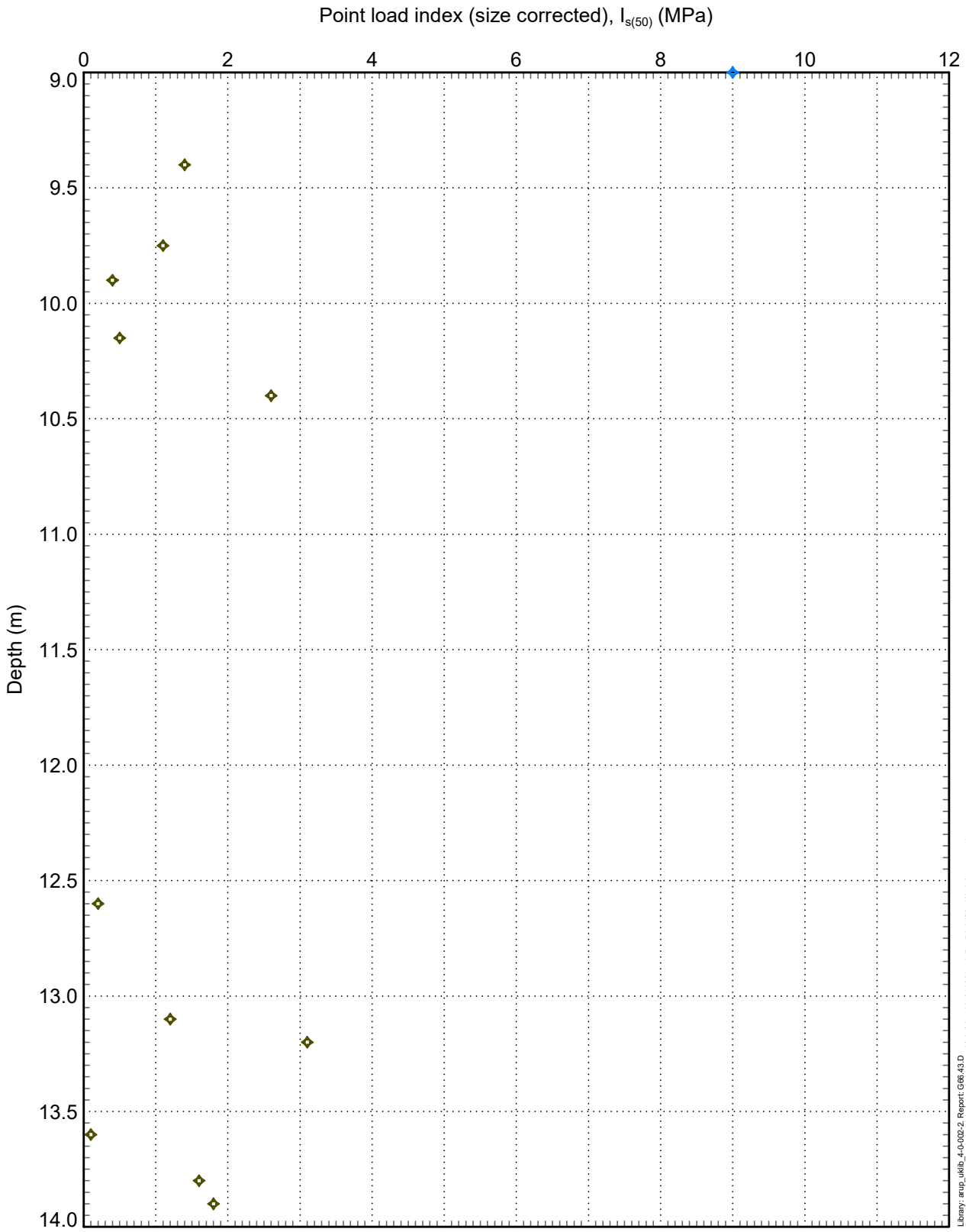
Figure Title
**Point load index (size corrected)
Axial tests**

Job No
276821

Figure No
S8-16a

ARUP_gINT v10.00.01.07. Made by Jamie Belkin on 5-Oct-21

- Sandstone (RK-Sdst)
- Glacial Deposits Cohesive (GD-C)
- ◆ BH CLR004A



ARUP

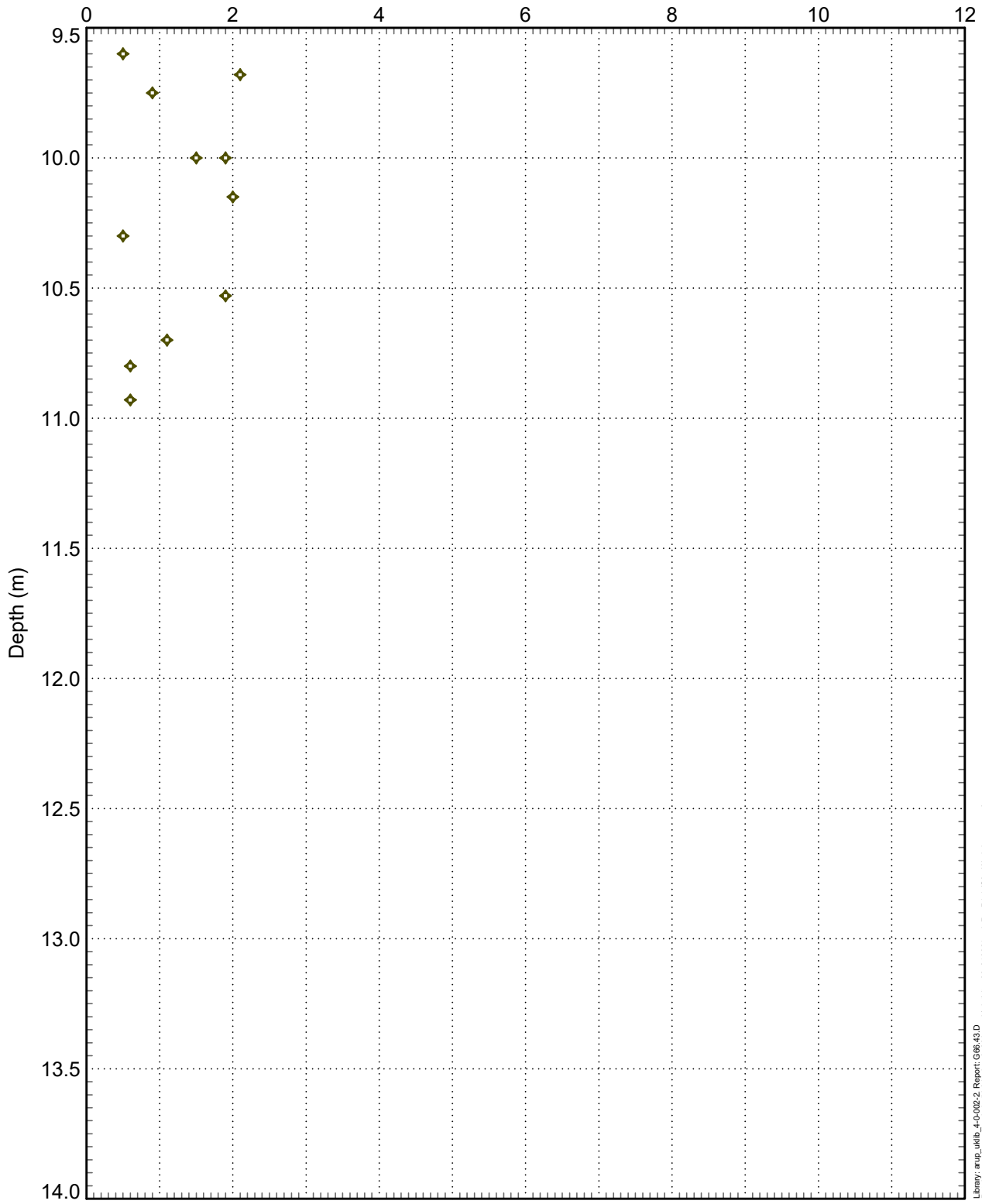
Job Title
A66 NTP

Figure Title
**Point load index (size corrected)
Diametral tests**

Job No
276821

Figure No
S8-16b

Point load index (size corrected), $I_{s(50)}$ (MPa)



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Database: c:\users\jmb\Documents\A66\A66_210921.gdb\RevP1.1 (SO - Work in progress)

■ Sandstone (RK-Sdst)
◆ BH CLR004A

ARUP

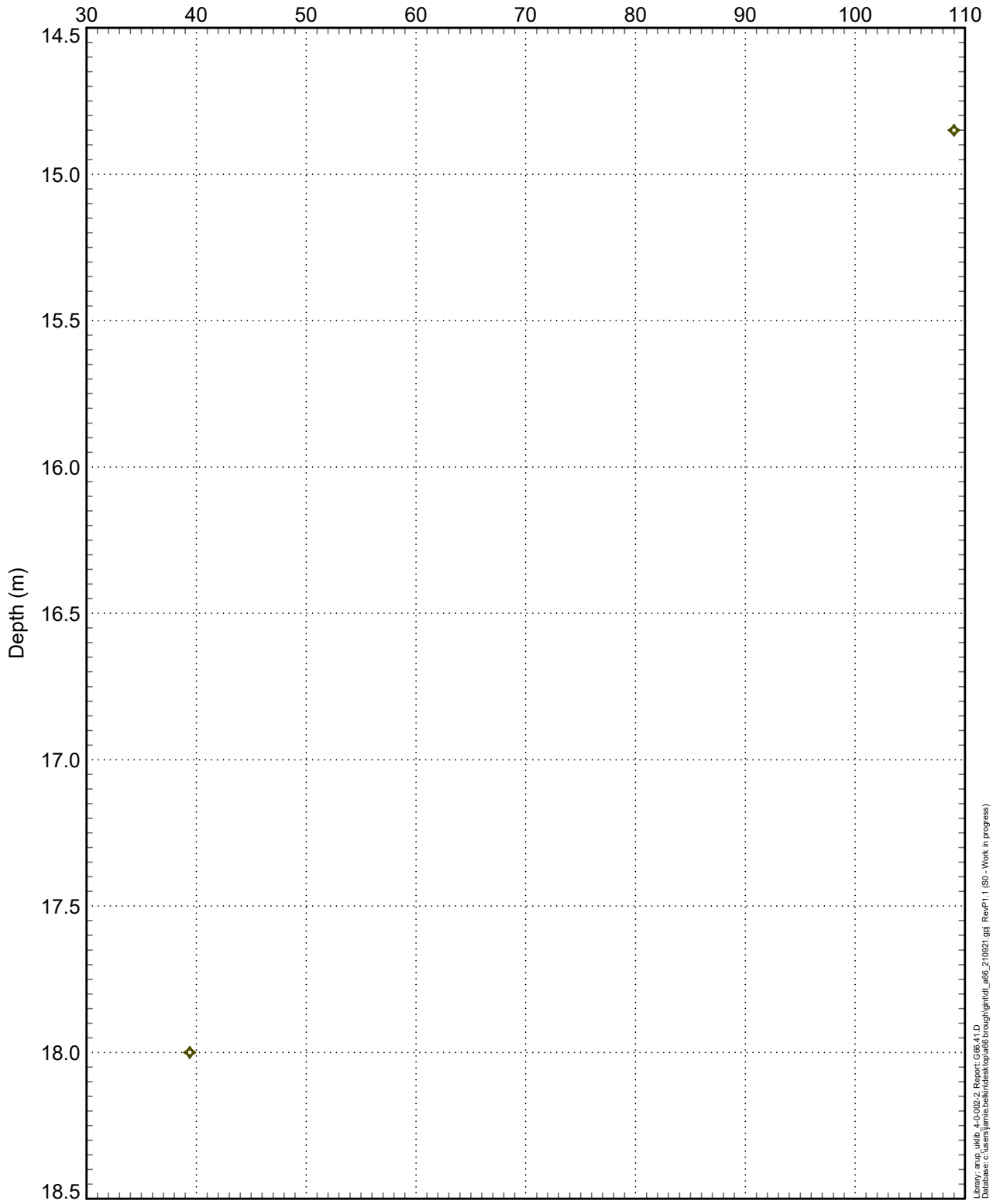
Job Title
A66 NTP

Figure Title
**Point load index (size corrected)
Irregular lump tests**

Job No
276821

Figure No
S8-16c

Uniaxial (unconfined) compressive strength, σ_c (MPa)



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Database: c:\arsp\jamie.belkin\desktop\p66_brough\mtdt_a66_210921.gdb RevP1.1 (SO - Work in progress)

- Sandstone (RK-Sdst)
- ◆ BH CLR004A

ARUP

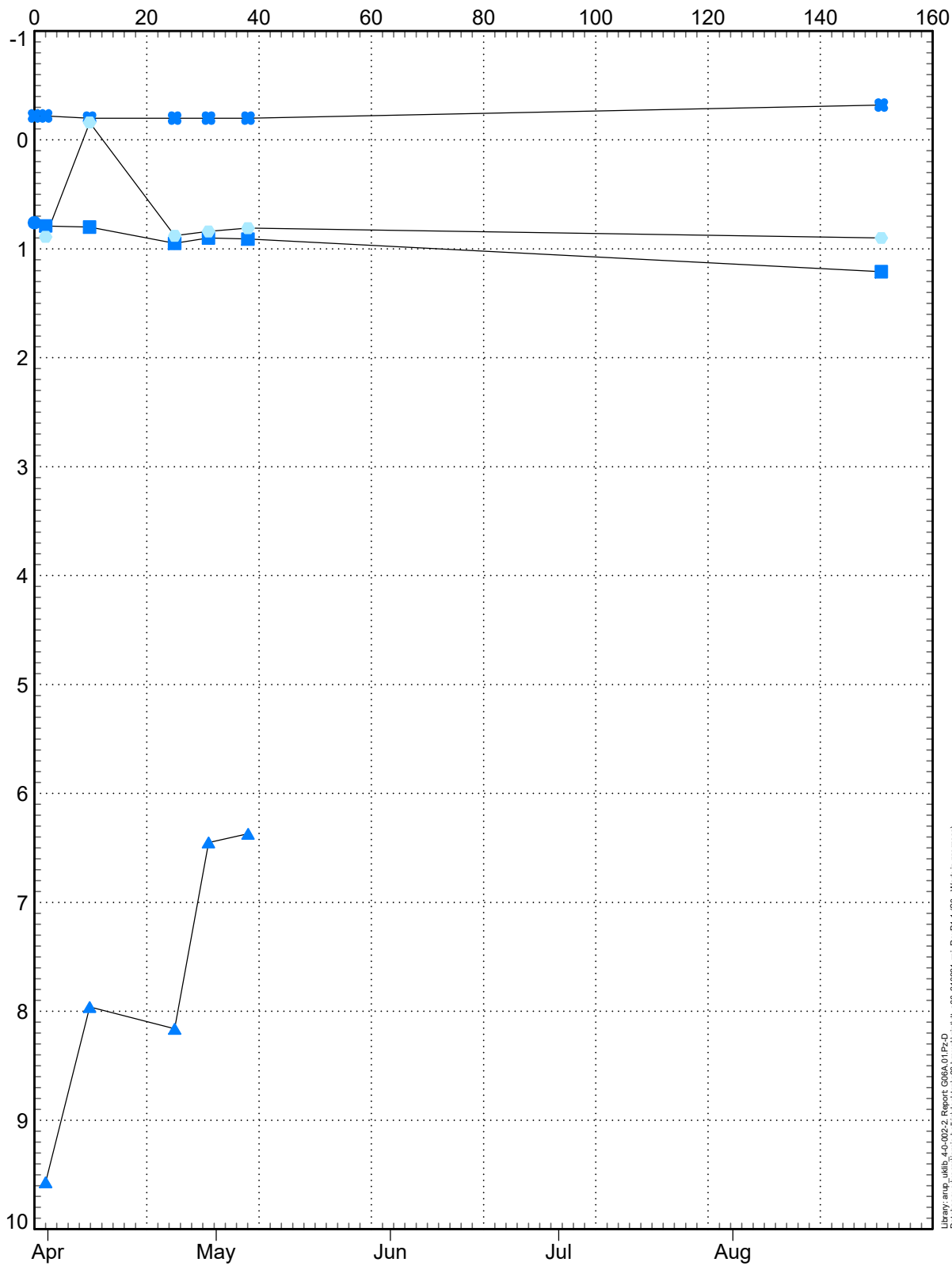
Job Title
A66 NTP

Figure Title
Uniaxial compressive strength

Job No
276821

Figure No
S8-17

DAYS SINCE 29 MARCH 2021



Library: arup_uklib_4-0-002-2; Report: G06A.01/Pz-D Database: c:\users\jamie.balkin\desktop\pzd_brofighnt\ot_ar66_210921.gpr RevP1.1 (SO - Work in progress)

ARUP - gINT v10.00.01.07. Made by Jamie Balkin on 5-Oct-21

- Glacial Deposits Cohesive (GD-C)
- Glacial Deposits Granular (GD-G)
- WS CLR001 @ 2.00m
- WS CLR003 @ 2.50m
- ▲ BS CLR001A @ 15.50m
- BS CLR003A @ 6.00m
- BS CLR004A @ 4.00m

ARUP

Job Title
A66 NTP

Figure Title
Piezometric data vs time

Job No
276821

Figure No
S8-18

E Geo-Environmental Testing Suites

E.1 Testing Suites and Limit of Detections

SOIL TESTING

Determinand	Units	LoD
Suite E1a - Primary Metals and Metalloids		
Arsenic	mg/kg	1
Boron (Water Soluble)	mg/kg	1
Cadmium	mg/kg	1
Total Chromium	mg/kg	1
Trivalent Chromium	mg/kg	1
Hexavalent Chromium	mg/kg	1
Copper	mg/kg	1
Lead	mg/kg	1
Mercury	mg/kg	1
Nickel	mg/kg	1
Selenium	mg/kg	1
Zinc	mg/kg	1
Suite E2 – Inorganics		
pH	pH units	0.1
SOM	% w/w	0.01
TOC	% w/w	0.01
Sulphate	mg/kg	0.01
Sulphides	mg/kg	0.01
Loss on ignition	% w/w	0.1
Suite E3 - CN/Phenol		
Free Cyanide	mg/kg	1
Phenols - total	mg/kg	1
Suite E4a - Asbestos		
Asbestos Presence and ID	% w/w	0.001
Suite E4b - Asbestos		
Asbestos Quantification	% w/w	0.001
Suite E6a - TPHCWG		
TPHCWG	mg/kg	0.01
Suite E6b – BTEX		
BTEX	mg/kg	0.01
Suite E7a - Speciated PAHs 1		
USEPA 16 PAHs	mg/kg	0.01

GROUNDWATER AND SURFACE WATER TESTING

Determinand	Units	LoD
Suite F1a - Metals and Metalloids		
Arsenic	µg/l	1
Cadmium	µg/l	0.01
Chromium (III & VI)	µg/l	1
Copper	µg/l	0.1
Iron	µg/l	100
Lead	µg/l	0.1
Mercury	µg/l	0.01
Nickel	µg/l	1
Selenium	µg/l	1
Zinc	µg/l	1
pH value	pH Units	0.1
Calcium	mg/l	1
Hardness	CaCO ₃ µg/l	2
Alkalinity as CaCO ₃	µg/l	2
Dissolved organic carbon (DOC)	µg/l	1
Suite F1b - Metals and Metalloids		
Boron	µg/l	100
Magnesium	mg/l	1
Manganese	µg/l	1
Molybdenum	µg/l	1
Vanadium	µg/l	1
Suite F2 - Major Ions		
Sulphate	µg/l	1000
Chloride	mg/l	10
Nitrate	µg/l	1
Sulphide	µg S ²⁻ /l	0.1
Nitrite	µg/l	100
Sodium	mg/l	100
Potassium	mg/l	1
Suite F3 - Ammoniacal Nitrogen		
Ammoniacal Nitrogen (to be reported as ammoniacal nitrogen as N and as unionised ammonia)	µg/l	50
Suite F5 - Total Suspended Solids		
Total Suspended Solids	mg/l	10
Suite F6 - Oxygen Demand		
Biological Oxygen Demand	µg O ₂ /l	1000
Chemical Oxygen Demand	µg O ₂ /l	50
Suite F7a – TPHCWG		
TPHCWG	µg/l	1

Suite F7b – BTEX		
BTEX	µg/l	0.1
Suite F8 - Speciated PAHs		
PAHs (USEPA 16)	µg/l	0.0001
Suite F10 Phenols and Cyanides		
Free cyanide	µg/l	0.5
Phenol	µg/l	1

E.2 Scheme 7 Sample Register

Exploratory Hole Number	Depth	Strata Type	Suite of analysis								
			Suite E1a - Primary Metals and Metalloids	Suite E2 - Inorganics	Suite E3 - Cyanide/Phenol	Suite E4a - Asbestos Presence & ID	Suite E4b - Asbestos Quantification	Suite E6a - TPHCWG	Suite E6b - BTEX	Suite 7a - USEPA PAHs	Suite H - 2 Stage Inert Waste Landfill Schedule S1.20.5
BH BB004	0.50	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB004	2.40	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB005	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB005	3.50	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB007	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB007	1.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB008	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB008	0.60	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB009	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB009	1.00	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB010	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB010	0.40	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB011	0.20	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB012	0.20	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB013	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB013	1.00	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB014	0.10	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB015	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB016	1.00	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB017	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB018	0.70	Rock	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB019	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB020	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB021	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB023	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB023	1.00	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH BB026	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BHBB002	0.3	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BHBB002	1	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BHBB002	3	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
BHBB003	0.20	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
BHBB003	0.80	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
HTPB001	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP BB011	0.30	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP BB011	1.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP BB012	0.25	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP BB013	0.30	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP BB013	1.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓

Exploratory Hole Number	Depth	Strata Type	Suite of analysis								
			Suite E1a - Primary Metals and Metalloids	Suite E2 - Inorganics	Suite E3 - Cyanide/Phenol	Suite E4a - Asbestos Presence & ID	Suite E4b - Asbestos Quantification	Suite E6a - TPHCWG	Suite E6b - BTEX	Suite 7a - USEPA PAHs	Suite H - 2 Stage Inert Waste Landfill Schedule S1.20.5
TPBB001	0.2	Glacial	✓	✓	✓			✓	✓	✓	✓
TPBB001	2	Glacial	✓	✓	✓			✓	✓	✓	✓
TPBB002	0.4	Glacial	✓	✓	✓			✓	✓	✓	
TPBB003	0.10	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	
TPBB004	0.30	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TPBB004	2.50	Glacial	✓	✓	✓			✓	✓	✓	
TPBB006	0.20	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	
TPBB006	1.00	Glacial	✓	✓	✓			✓	✓	✓	✓
TPBB007	0.40	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	
TPBB007	1.00	Glacial	✓	✓	✓			✓	✓	✓	
TPBB008	0.30	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	✓
TPBB009	0.30	Made Ground	✓	✓	✓	✓	✓	✓	✓	✓	✓
TPBB009	1.00	Glacial	✓	✓	✓			✓	✓	✓	
TPBB010	0.20	Glacial	✓	✓	✓	✓	✓	✓	✓	✓	
TPBB010	1.00	Glacial	✓	✓	✓			✓	✓	✓	
TPBB002	2	Glacial	✓	✓	✓			✓	✓	✓	
WS BB001	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	
WS BB001	0.80	Glacial	✓	✓	✓						

E.3 Scheme 8 Sample Register

Exploratory Hole Number	Top Depth	Strata Type	Suite of analysis required								
			Suite E1a - Primary Metals and Metalloids	Suite E2 - Inorganics	Suite E3 - Cyanide/Phenol	Suite E4a - Asbestos Presence & ID	Suite E4b - Asbestos Quantification	Suite E6a - TPHCWG	Suite E6b - BTEX	Suite 7a - USEPA PAHs	Suite H - 2 Stage Inert Waste Landfill Schedule S1.20.5
TP CLR002	0.35	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR002	1.20	Glacial Deposits	✓	✓	✓						
TP CLR002A	0.40	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR003	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR007	0.40	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR001	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR005	0.40	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR005	1.20	Glacial Deposits	✓	✓	✓			✓	✓	✓	✓
TP CLR006	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
BH CLR001	0.20	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
BH CLR003	0.20	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
BH CLR003	1.00	Glacial Deposits	✓	✓	✓			✓	✓	✓	
TP CLR004	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR004	2.20	Glacial Deposits	✓	✓	✓			✓	✓	✓	

Exploratory Hole Number	Top Depth	Strata Type	Suite of analysis required								
			Suite E1a - Primary Metals and Metalloids	Suite E2 - Inorganics	Suite E3 - Cyanide/Phenol	Suite E4a - Asbestos Presence & ID	Suite E4b - Asbestos Quantification	Suite E6a - TPHCWG	Suite E6b - BTEX	Suite 7a - USEPA PAHs	Suite H - 2 Stage Inert Waste Landfill Schedule S1.20.5
TP CLR008	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR008	2.40	Glacial Deposits	✓	✓	✓			✓	✓	✓	
TP CLR009	0.30	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR009	1.20	Glacial Deposits	✓	✓	✓			✓	✓	✓	✓
BH CLR004	0.20	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
WS CLR003	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	
WS CLR001	0.20	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
WS CLR001	1.00	Glacial Deposits	✓	✓	✓			✓	✓	✓	
WS CLR005	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR020	0.20	Topsoil	✓	✓	✓	✓	✓	✓	✓	✓	✓
TP CLR020	1.00	Glacial Deposits	✓	✓	✓			✓	✓	✓	
TPCLR015	0.40	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR23	0.40	Glacial Deposits	✓	✓	✓	✓	✓	✓	✓	✓	
TP CLR23	1.20	Glacial Deposits	✓	✓	✓			✓	✓	✓	
TP CLR013	0.20	Topsoil									✓

F Geo-Environmental Risk Assessment Methodology

F.1 Human Health Risk Assessment Methodology

The screening approach adopted by the A66 NTP Integrated Project Team is consistent with the “Tier 2 Generic Quantitative Risk Assessment” (GQRA) approach as detailed in the Land Contamination Risk Management [46] framework guidance for the investigation of potentially contaminated land.

Potential risks to human health associated with soils encountered during the ground investigation have been assessed by screening the results of chemical testing against relevant Generic Assessment Criteria (GAC).

The screening approach identifies if there are potentially unacceptable risks to human receptors from exposure to soil contaminants, and whether there is a need for additional site-specific risk assessment or to undertake remedial action to mitigate risks should exceedances be identified.

GACs represent trigger values that may indicate a “Significant Possibility of Significant Harm” (SPOSH) to human health if contaminants exceed the level noted. Where soil concentration values are below the GACs and where the land use scenario selected is representative of, or conservative for the site being investigated, it can be assumed it is unlikely SPOSH exists, and remedial action would not be required to render a site fit for purpose.

When a GAC is exceeded it is not necessarily a sign the land is contaminated to an extent that the site is unsuitable for its current or intended use and requires remediation, however more consideration should be given to determine if it truly reflects a risk under a more site-specific land use. Further assessment may comprise Detailed Quantitative Risk Assessment (DQRA) which removes many of the generic (and therefore conservative) assumptions inherent in a GAC.

Generic Assessment Criteria (GAC) are for the most part (with the exception of cyanide) protective of chronic (i.e. long term, low dose) exposure rather than the effects of acute (i.e. short term, high dose) exposure. In general, GACs which are protective of chronic exposure are orders of magnitude lower than GACs which are protective of acute exposure.

Cyanide, however is toxic by acute (oral) exposure and the cyanide GAC is protective of the acute exposure route.

Soil Samples have been screened against Generic Assessment Criteria (GAC) selected from the following strict hierarchy:

- Category 4 Screening Levels (C4SLs) as coordinated by CL:AIRE on behalf of the Department for Environment, Food and Rural Affairs [51]
- LQM/CIEH Suitable 4 Use Levels (S4UL) [51] where published C4SLs are not available; or
- Atkins ATRISKsoil Soil Screening Values (SSVs) [53]

The adopted assessment criteria have been developed under the UK approach to risk assessment and are fully compliant with parameters as specified in the Environment Agency’s series of guidance documents. GACs have been developed for a number of ‘standard’ land uses,.

Following a review of the standard land use scenarios underpinning these models, we are of the opinion the “Public Open Space – Park” (POSPark) land use, is considered to be suitably precautionary for the development under consideration (i.e. major highway scheme with associated earthworks, structures, road verge landscaping and ancillary features such as attenuation ponds etc) with regards to selection of critical receptor and behavioural exposure parameters.

Organic contamination can be bound to organic matter within soils, which reduces the mobility and availability of organic contaminants to the environment. The more organic matter present, the less mobile organic contaminants are.

A low Soil Organic Matter (SOM) value of 1% is considered to be conservative for the purposes of the assessment and has been selected when selecting GACs.

F.2 Controlled Waters Risk Assessment Methodology

A tiered approach has been developed to assess leachate, groundwater and surface water samples recovered from the ground investigation.

An assessment of the risk to controlled waters (groundwater resource and surface waters) has been undertaken in line with the Groundwater Protection Guidance [48]. The document outlines basic concepts and principles of management, monitoring and risk assessment for groundwater with respect to protecting the quality and quantity of groundwater in accordance with the Water Framework Directive (2000/60/EC).

Due to the linear nature of the scheme, the spatial distribution of the sample locations and the limited amount of groundwater, leachate and surface water analytical data, it is not appropriate to infer correlations between sampling locations and each sample has been assessed as a discrete data point.

Water samples recovered as part of this ground investigation comprise a baseline survey of groundwater and surface waters prior to construction activities, and therefore substances failing Tier 1 (T1) or Tier 2 (T2 DWS or T2 EQS) assessment will be reported factually for information only.

Tier 1 Assessment (T1)

Groundwater, leachate and surface water samples have been subject to an initial conservative Tier 1 (T1) controlled waters assessment. This has utilised the lower of the UK Drinking Water Standards (DWS) [58] or Environmental Quality Standards (EQS) [59] following the process outlined below:

- Use the lowest of DWS or EQS
- Hierarchy of formal DWS as follows:
 - UK/EU DWS
 - WHO DWS
 - USEPA DWS
- Hierarchy of EQS as follows:
 - use MAC (Maximum Allowable Concentration)
 - If no MAC, use AA (Annual Average)
- If no DWS or EQS is available, use limit of detection (LoD)

However, there are a number of substances for which there is no relevant Water Quality Standard (WQS). For these substances without a formal WQS, a substance specific decision has been made to either adopt the LoD as a conservative WQS, or to not assign a WQS and report the data for information only.

Tier 1 (T1) Water Quality Standards (WQS) are summarised in Appendix E.

Locations where exceedances of T1 WQS have been identified are reviewed to determine whether it is possible to exclude the DWS or EQS receptors from the T1 assessment (e.g. due to sample type / proximity to surface water etc). If it is possible to exclude the DWS or EQS receptor, the T1 exceedances can progress to a more relevant T2 (DWS) or T2 (EQS) assessment.

T1 exceedances identified at locations where DWS and EQS are both considered relevant are unable to progress to a T2 CWRA.

Tier 2 Assessment (T2)

The Tier 2 Assessment recognises the importance of assessing the sample against the relevant WQS at the correct assessment point. (e.g. a groundwater sample, distal to a surface water receptor would be assessed against Drinking Water Standards (DWS) only to protect groundwater drinking water resources, and a surface water sample would be assessed against EQS only).

The assessment point (AP) is also important.

- For Drinking Water protection, the AP is at the abstraction point / consumer tap;
- For Groundwater resource protection, the AP is 50m downgradient of the source; and
- For Surface Water protection, the AP is in the Surface Water, after Dilution.

Tier 2 Groundwater Resource Protection Assessment (T2 DWS)

For substances that exceed the Tier 1 (T1) assessment at locations where only groundwater resource protection is considered relevant, a Tier 2 Groundwater Resource Protection Assessment (T2 DWS) has been undertaken with the following rules applied:

- Hierarchy of formal DWS as follows:
 - UK/EU DWS
 - WHO DWS
 - USEPA DWS
- For Hazardous Substances:
 - use formal DWS if available.
 - If no formal DWS available, Use MRL / LoD.
- For Non Hazardous Substances,
 - use formal DWS if available.
 - if no formal DWS available, do not evaluate / no assessment is required.

Tier 2 Groundwater Resource Protection Assessment (T2 DWS) water quality standards are summarised in Appendix E.

Tier 2 Surface Water Assessment (T2 EQS)

For substances that exceed the Tier 1 (T1) assessment at locations where only surface water protection is considered relevant, a Tier 2 Surface Water Assessment (T2 EQS) has been undertaken with the following rules applied:

- if EQS are available, use EQS
- Hierarchy of EQS as follows:
 - use MAC (Maximum Allowable Concentration)
 - If no MAC, use AA (Annual Average)
- For Copper, Manganese and Zinc, consider using bioavailability corrections (M-BAT) tool;
- if no EQS is available,
 - consider developing Predicted No-Effect concentration (PNEC) or
 - alternatively, consider MRL / LOD

Tier 2 Surface Water Assessment (T2 EQS) water quality standards are summarised in Appendix E.

G Waste Hazard Assessment Methodology

It is hoped the scheme design can be optimised to retain / incorporate all site won excavated soils within the wider project and to minimise the requirement for off-site disposal. However, it is likely a proportion of site generated excavation arisings may be unsuitable for re-use within the scheme due to programme, storage space, geotechnical or geoenvironmental properties and therefore require to be discarded as waste.

A preliminary waste classification exercise has been undertaken using the results obtained from the ground investigations to determine the likely waste classification of soils within the scheme and provide a likely List of Waste (LoW) code in the event they require to be discarded as a waste.

Waste classification is a two-stage process, with the first step comprising a hazardous properties assessment of the soil quality data in line with the guidance set out in the Environment Agency: Guidance on the Classification and Assessment of Waste Technical Guidance WM3 document [60], to provide the likely LoW code.

The LoW codes are required to be provided to the receiving landfill. In relation to 'Construction and Demolition Wastes' the most likely relevant LoW codes are as follows:

- **17 05 03** - 'Hazardous' materials will have a LoW code of "Construction and Demolition Wastes * (soils and stones containing hazardous substances)". or
- **17 05 04** - 'Non-Hazardous' materials have the LoW code: "Construction and Demolition Wastes (soils and stones other than those in 17 05 03)".

If soils are classified as "non-hazardous" (LoW code 17 05 04), no further assessment is necessary and they may either be deposited in a 'non-hazardous' waste landfill (for which no WAC tests are required) or may potentially be considered as 'inert' waste (a sub-set of 'non-hazardous' waste), however this would require confirmation of suitability for this particular waste stream through WAC testing.

However, if soils are classified as "hazardous" (LoW code 17 05 03), a second step is required to be undertaken which assesses the potential mobility of the contaminants within the materials in a landfill by considering the results of waste acceptance criteria (WAC) testing

Generally, wastes that are classified as 'hazardous' require to be deposited in a hazardous waste landfill or within a stable non-reactive hazardous waste cell (typically restricted to asbestos containing materials) (depending on the WAC test results and interpretation).

Soil quality data from the ground investigation was entered into a hazard assessment tool, HazWasteOnline™

HazWasteOnline™ includes several options for using the different valencies (chemical species) or compounds that may be present, (e.g. whether the chromium found is chromium III or the less common but more toxic chromium VI). Where these options were available these were generally set at the default (worst case assessment) for the model in accordance with the guidance set out in EA WM3. Where this is not the case justification and site-specific reasoning is given.

It must be noted that hazardous waste guidance in the UK is revised at regular intervals and the results of the assessment could change with subsequent revisions.

Project specific amendments made to the default assumptions within HazWasteOnline

Default parameters HazWasteOnline™ assessment model can sometime provide an overly conservative assessment of the hazard posed by substances and therefore, as per the model

guidance, a number of site specific amendments require to be made more accurately reflect the specific species of contaminants found within the schemes. These are summarised as follows

1. Issues with the HazWasteOnline™ waste stream template which have been fixed:
 - a. The C5 band without a CAS-RN has been ignored.
 - b. Total TPH C10-C40 ali/aro has ignored.
 - c. Total TPH C5-C40 has been amended to TPH C6-C40.
2. Four different populations have been identified: Topsoil, Made Ground, Superficial Deposits and Rock each of which have separate jobs on HazWasteOnline™ for each soil type/population.
3. It is assumed Made Ground is homogenous vertical and laterally.
4. Metal species have been managed as follows:
 - a. **Arsenic** (arsenic) - arsenic could be present on agricultural land due to application of insecticide/wood preservative.
 - b. **Boron** (diboron trioxide; boric acid) - based on the hazard statements and molecular weight, physical form, and low solubility of Boron it is likely more soluble forms have been mobilised already on agricultural land.
 - c. **Cadmium** (Cadmium oxide) – Species based on the hazard statements, molecular weight, and very low solubility in water. The worst-case compounds (cadmium sulphate, chloride, fluoride & iodide) are not expected as they are either very soluble and/or compound's industrial usage not related to site history as site has been in agricultural land use
 - d. **Chromium III** (Chromium III oxide) – There is only one option on the template, and it is a reasonable worst case.
 - e. **Chromium VI compounds** – Although it can be found in wood preservatives there is no likely industrial /contaminative land use source on the sites.
 - f. **Copper** (Copper (I) oxide) - Based on hazard statements, molecular weight and insolubility in water. Sources can include brake pads/fungicides however, there are no likely industrial sources observed in the historical or current industrial review. It is also noted that the worst-case compound, copper sulphate, is very soluble and likely to have been leached away if ever present.
 - g. **Lead** compounds - Reasonable worst-case compound as there is insufficient chromium VI for lead chromate to be present.
 - h. **Mercury** inorganic compounds - Reasonable worst-case compound as the sites have a very limited industrial history.
 - i. **Nickel** (Dinickel hexacyano ferrate) - Reasonable worst-case compound as no industrial sources and insufficient Chromium VI for nickel chromate to be present.
 - j. **Selenium** (nickel (II) selenite) – The next most likely worst-case compound, nickel selenate, is soluble in water and as site is agricultural land it is likely to have been leached from soils if ever present.
 - k. **Zinc** - Reasonable worst-case compound given that there is insufficient chromium VI for zinc chromate to be present and no potential industrial sources for zinc chloride, zinc sulphate or zinc phosphate.
 - l. **Cyanide** (Salts of hydrogen cyanide) - Harmonised group entry used as most reasonable, it is unlikely complex cyanides and those specified elsewhere in the annex are present in this soil. *Note conversion factor based on a worst-case compound: sodium cyanide*
5. Flammable hazardous property thresholds have been altered to 10,000mg/kg. This is because the Hazardous Property (HP) HP 3 (i) – Flammable is unlikely to apply to this waste stream, due to the solid soil and natural moisture content of the samples. The concentration

required to provide a flammability risk is >10,000mg therefore, the risk of flammability from solid state soils with <1000mg/kg TPH is negligible.

H Geo-Environmental Screening Assessment

H.1 Scheme 7 Human Health

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1
Concentration exceeds saturation value but not GAC	50

ARUP

Hole Ref	BH BB002	BH BB002	BH BB002	BH BB003	BH BB003	BH BB004	BH BB004	BH BB005	BH BB005
Sample Ref	2	5	10A	2	4	0	10A	1	12A
Easting	398838.151	398838.151	398838.151	398885.998	398885.998	398947.771	398947.771	399075.055	399075.055
Northing	513606.272	513606.272	513606.272	513564.334	513564.334	513636.085	513636.085	513698.861	513698.861
Hole Elevation (mOD)									
Sample Depth (mbgl)	0.3	1	3	0.2	0.8	0.5	2.4	0.2	3.5
Sample Date	01/02/21	01/02/21	01/02/21	03/02/21	03/02/21	19/02/21	19/02/21	19/02/21	19/02/21
Investigation	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C
Geology	Made Ground	Made Ground	Glacial Till	Made Ground	Glacial Till	Made Ground	Glacial Till	Topsoil	Glacial Till

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	Saturation Value	Total > Saturation
Arsenic	170	C4SL	mg/kg	67 of 67	2	0.32	260		0
Boron	46000	LQM S4UL	mg/kg	53 of 67	0	0.2	1.4		0
Cadmium	880	C4SL	mg/kg	66 of 67	0	0.044	0.8		0
Chromium	33000	LQM S4UL	mg/kg	67 of 67	0	1.1	54		0
Trivalent Chromium	33000	LQM S4UL	mg/kg	18 of 66	0	10	210		0
Chromium - Hexavalent	250	C4SL	mg/kg	3 of 65	0	0.03	1		0
Copper	44000	LQM S4UL	mg/kg	67 of 67	0	0.9	74		0
Lead	1300	C4SL	mg/kg	67 of 67	0	8.3	230		0
Mercury	30	LQM S4UL	mg/kg	29 of 67	0	0.05	0.32	25.8	0
Nickel	3400	LQM S4UL	mg/kg	67 of 67	0	4.3	80		0
Selenium	1800	LQM S4UL	mg/kg	12 of 67	0	0.5	1		0
Zinc	170000	LQM S4UL	mg/kg	67 of 67	0	34	390		0
Benzene	90	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01		0
Toluene	87000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	869	0
Ethylbenzene	17000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	518	0
Xylene	17000	LQM S4UL	mg/kg	65 of 67	0	100	11300		0
Aliphatics >C6-8	150000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	144	0
Aliphatics >C8-10	14000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	78	0
Aliphatics >C10-12	21000	LQM S4UL	mg/kg	1 of 65	0	1.5	1.8	48	0
Aliphatics >C12-16	25000	LQM S4UL	mg/kg	1 of 65	0	1.2	9.5	24	0
Aliphatics >C16-21	450000	LQM S4UL	mg/kg	1 of 65	0	1.5	21	0	0
Aliphatics >C21-35	450000	LQM S4UL	mg/kg	1 of 65	0	3.4	8.9	0	0
Aliphatics >C35-44	450000	LQM S4UL	mg/kg	0 of 65	0	3.4	3.4	0	0
Aliphatics >C10-44		No GAC	mg/kg	-	10	10		0	0
Aromatics >C5-7	76000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	1220	0
Aromatics >C7-8	87000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	869	0
Aromatics >C8-10	7200	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	613	0
Aromatics >C10-12	9200	LQM S4UL	mg/kg	0 of 65	0	0.9	0.9	364	0
Aromatics >C12-16	10000	LQM S4UL	mg/kg	0 of 65	0	0.5	0.5	0	0
Aromatics >C16-21	7600	LQM S4UL	mg/kg	0 of 65	0	0.6	0.6	0	0
Aromatics >C10-44		No GAC	mg/kg	-	10	67		0	0
Total Aliphatics and Aromatics C10-C44		No GAC	mg/kg	-	10	67		0	0
Acenaphthene	29000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.22		0
Acenaphthylene	29000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.04		0
Anthracene	150000	LQM S4UL	mg/kg	3 of 65	0	0.03	0.61		0
Benzo(a)anthracene	49	LQM S4UL	mg/kg	12 of 65	0	0.03	2.7		0
Benzo(a)pyrene	11	LQM S4UL	mg/kg	16 of 65	0	0.03	5.8		0
Benzo(b)fluoranthene	13	LQM S4UL	mg/kg	17 of 65	0	0.03	6.8		0
Benzo (g,h,i) perylene	1400	LQM S4UL	mg/kg	6 of 65	0	0.03	0.79		0
Benzo(k)fluoranthene	370	LQM S4UL	mg/kg	12 of 65	0	0.03	2.4		0
Chrysene	93	LQM S4UL	mg/kg	11 of 65	0	0.03	1.9		0
Dibenz-a-h-anthracene	1.1	LQM S4UL	mg/kg	2 of 65	0	0.03	0.22		0
Fluoranthene	6300	LQM S4UL	mg/kg	4 of 65	0	0.03	0.99		0
Fluorene	20000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.28		0
Indeno(1,2,3-cd)pyrene	150	LQM S4UL	mg/kg	12 of 65	0	0.03	2.5		0
Naphthalene	1200	LQM S4UL	mg/kg	2 of 65	0	0.03	0.05	76.4	0
Phenanthrene	6200	LQM S4UL	mg/kg	16 of 65	0	0.03	3.1		0
Pyrene	15000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01		0
Pah_Total		mg/kg	No GAC	-	0.1	29		0	0
pH		pH Units	No GAC	-	5.4	9		0	0
Sulphate as SO4		mg/l	No GAC	-	0.04	0.1		0	0
Sulphate as SO4		mg/l	No GAC	-	13	260		0	0
Sulphate as SO4		mg/kg	No GAC	-	2.1	54		0	0
Sulphide		mg/kg	No GAC	-	1	1		0	0
Sulphur		%	No GAC	-	0.03	0.85		0	0
Total Organic Carbon		%	No GAC	-	0.3	10		0	0
Cyanide Free	34	AtkinsAtrisk	mg/kg	41 of 66	0	0.1	0.9		0
Phenol (Monohydric)	760	LQM S4UL	mg/kg	14 of 66	0	0.3	1.8		0
Loss on ignition		%	No GAC	-	2.3	27		0	0
Organic matter		%	No GAC	-	0.5	18		0	0
Asbestos (Presence of)		---	No GAC	-				NAD	NAD
Asbestos Analysts Comments		---	No GAC	-				na	na

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1
Concentration exceeds saturation value but not GAC	50



Hole Ref	BH BB006	BH BB006	BH BB007	BH BB007	BH BB008	BH BB008	BH BB009	BH BB009	BH BB010
Sample Ref	1	9	1	4	1	3	1	4	3
Eastings	399163.291	399163.291	399265.479	399265.479	399306.435	399306.435	399398.261	399398.261	399516.023
Northing	513717.945	513717.945	513764.206	513764.206	513672.558	513672.558	513794.791	513794.791	513792.825
Hole Elevation (mOD)									
Sample Depth (mbgl)	0.2	1.7	0.2	1.2	0.2	0.6	0.2	1	0.2
Sample Date	19/02/21	19/02/21	08/02/21	08/02/21	08/02/21	08/02/21	08/02/21	08/02/21	08/02/21
Investigation	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C
Geology	Glacial Till	Glacial Till	Glacial Till	Glacial Till	Glacial Till	Glacial Till	Glacial Till	Glacial Till	Made Ground

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	Saturation Value	Total > Saturation
Arsenic	170	C4SL	mg/kg	67 of 67	2	0.32	260		0
Boron	46000	LQM S4UL	mg/kg	53 of 67	0	0.2	1.4		0
Cadmium	880	C4SL	mg/kg	66 of 67	0	0.044	0.8		0
Chromium	33000	LQM S4UL	mg/kg	67 of 67	0	1.1	54		0
Trivalent Chromium	33000	LQM S4UL	mg/kg	18 of 66	0	10	210		0
Chromium - Hexavalent	250	C4SL	mg/kg	3 of 65	0	0.03	1		0
Copper	44000	LQM S4UL	mg/kg	67 of 67	0	0.9	74		0
Lead	1300	C4SL	mg/kg	67 of 67	0	8.3	230		0
Mercury	30	LQM S4UL	mg/kg	29 of 67	0	0.05	0.32	25.8	0
Nickel	3400	LQM S4UL	mg/kg	67 of 67	0	4.3	80		0
Selenium	1800	LQM S4UL	mg/kg	12 of 67	0	0.5	1		0
Zinc	170000	LQM S4UL	mg/kg	67 of 67	0	34	390		0
Benzene	90	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01		0
Toluene	87000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	869	0
Ethylbenzene	17000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	518	0
Xylene	17000	LQM S4UL	mg/kg	65 of 67	0	100	11300		0
Aliphatics >C6-8	150000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	144	0
Aliphatics >C8-10	14000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	78	0
Aliphatics >C10-12	21000	LQM S4UL	mg/kg	1 of 65	0	1.5	1.8	48	0
Aliphatics >C12-16	25000	LQM S4UL	mg/kg	1 of 65	0	1.2	9.5	24	0
Aliphatics >C16-21	450000	LQM S4UL	mg/kg	1 of 65	0	1.5	21		0
Aliphatics >C21-35	450000	LQM S4UL	mg/kg	1 of 65	0	3.4	8.9		0
Aliphatics >C35-44	450000	LQM S4UL	mg/kg	0 of 65	0	3.4	3.4		0
Aliphatics >C10-44			mg/kg	No GAC	-	10	10		0
Aromatics >C5-7	76000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	1220	0
Aromatics >C7-8	87000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	869	0
Aromatics >C8-10	7200	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01	613	0
Aromatics >C10-12	9200	LQM S4UL	mg/kg	0 of 65	0	0.9	0.9	364	0
Aromatics >C12-16	10000	LQM S4UL	mg/kg	0 of 65	0	0.5	0.5		0
Aromatics >C16-21	7600	LQM S4UL	mg/kg	0 of 65	0	0.6	0.6		0
Aromatics >C10-44			mg/kg	No GAC	-	10	67		0
Total Aliphatics and Aromatics C10-C44			mg/kg	No GAC	-	10	67		0
Acenaphthene	29000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.22		0
Acenaphthylene	29000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.04		0
Anthracene	150000	LQM S4UL	mg/kg	3 of 65	0	0.03	0.61		0
Benzo(a)anthracene	49	LQM S4UL	mg/kg	12 of 65	0	0.03	2.7		0
Benzo(a)pyrene	11	LQM S4UL	mg/kg	16 of 65	0	0.03	5.8		0
Benzo(b)fluoranthene	13	LQM S4UL	mg/kg	17 of 65	0	0.03	6.8		0
Benzo (g,h,i) perylene	1400	LQM S4UL	mg/kg	6 of 65	0	0.03	0.79		0
Benzo(k)fluoranthene	370	LQM S4UL	mg/kg	12 of 65	0	0.03	2.4		0
Chrysene	93	LQM S4UL	mg/kg	11 of 65	0	0.03	1.9		0
Dibenz-a-h-anthracene	1.1	LQM S4UL	mg/kg	2 of 65	0	0.03	0.22		0
Fluoranthene	6300	LQM S4UL	mg/kg	4 of 65	0	0.03	0.99		0
Fluorene	20000	LQM S4UL	mg/kg	2 of 65	0	0.03	0.28		0
Indeno(1,2,3-cd)pyrene	150	LQM S4UL	mg/kg	12 of 65	0	0.03	2.5		0
Naphthalene	1200	LQM S4UL	mg/kg	2 of 65	0	0.03	0.05	76.4	0
Phenanthrene	6200	LQM S4UL	mg/kg	16 of 65	0	0.03	3.1		0
Pyrene	15000	LQM S4UL	mg/kg	0 of 65	0	0.01	0.01		0
Pah_Total			mg/kg	No GAC	-	0.1	29		0
pH			pH Units	No GAC	-	5.4	9		0
Sulphate as SO4			mg/l	No GAC	-	0.04	0.1		0
Sulphate as SO4			mg/l	No GAC	-	13	260		0
Sulphate as SO4			mg/kg	No GAC	-	2.1	54		0
Sulphide			mg/kg	No GAC	-	1	1		0
Sulphur			%	No GAC	-	0.03	0.85		0
Total Organic Carbon			%	No GAC	-	0.3	10		0
Cyanide Free	34	AtkinsAtrisk	mg/kg	41 of 66	0	0.1	0.9		0
Phenol (Monohydric)	760	LQM S4UL	mg/kg	14 of 66	0	0.3	1.8		0
Loss on ignition			%	No GAC	-	2.3	27		0
Organic matter			%	No GAC	-	0.5	18		0
Asbestos (Presence of)			---	No GAC	-				0
Asbestos Analysts Comments			---	No GAC	-				0

H.2 Scheme 7 Controlled Waters

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	BH BB007	BH BB013
Sample Ref	100	100
Easting	399265.479	399597.93
Northing	513764.206	513848.958
Hole Elevation (mOD)		
Sample Depth (mbgl)	4.45	2.85
Piezometer top (mbgl)		
Piezometer base (mbgl)		
Sample Date	30/03/21	30/03/21
Investigation	4322C	4322C
Aquifer		

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	95th %ile		
Arsenic	0.01	UK DWS	mg/l	0 of 2	0	0.001	0.001	0.001	< 0.001	< 0.001
Cadmium	0.00045	EQS	mg/l	0 of 2	0	0.0001	0.0001	0.0001	< 0.0001	< 0.0001
Calcium		No screening value	mg/l	No GAC	-	75	81	80.70	81	75
Trivalent Chromium		No screening value	mg/l	No GAC	-	0.001	0.001	0.001	< 0.001	< 0.001
Chromium - Hexavalent	3.4	EQS	mg/l	0 of 2	0	0.007	0.007	0.007	< 0.007	< 0.007
Copper	0.001	EQS	mg/l	2 of 2	2	0.0022	0.0024	0.00239	0.0024	0.0022
Iron (Soluble)		No screening value	mg/l	No GAC	-	0.11	0.79	0.756	0.79	0.11
Lead	0.01	UK DWS	mg/l	2 of 2	0	0.0004	0.001	0.00097	0.001	0.0004
Mercury	0.00007	EQS	mg/l	0 of 2	0	0.0001	0.0001	0.0001	< 0.0001	< 0.0001
Nickel	0.02	UK DWS	mg/l	2 of 2	0	0.0018	0.0042	0.00408	0.0018	0.0042
Potassium		No screening value	mg/l	No GAC	-	4.2	6	5.910	6	4.2
Selenium	0.01	UK DWS	mg/l	2 of 2	0	0.0005	0.001	0.00098	0.0005	0.001
Sodium	200	UK DWS	mg/l	2 of 2	0	9.3	39	37.515	9.3	39
Zinc	0.0109	EQS	mg/l	2 of 2	1	0.0061	0.012	0.01171	0.012	0.0061
pH		No screening value	pH Units	No GAC	-	7.4	7.5	7.495	7.5	7.4
Total Alkalinity as CaCO3		No screening value	mg/l	No GAC	-	170	210	208.0	210	170
BOD (total, 5 day)		No screening value	mg/l	No GAC	-	6	17	16.450	17	6
Chemical oxygen demand		No screening value	mg/l	No GAC	-	20	400	381.0	20	400
Cyanide Free		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02	< 0.02
Dissolved Organic Carbon		No screening value	mg/l	No GAC	-	12	85	81.350	85	12
Total hardness		No screening value	mg/l	No GAC	-	236	246	245.50	236	246
Solids, Suspended		No screening value	mg/l	No GAC	-	190	24000	22809.50	190	24000
Un-ionised Ammonia		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02	< 0.02
Ammoniacal Nitrogen as N	0.04	EQS	mg/l	1 of 2	1	0.015	0.069	0.0663	0.069	< 0.015
Chloride	250000	UK DWS	mg/l	2 of 2	0	19	37	36.10	19	37
Nitrate as NO3	50000	UK DWS	mg/l	2 of 2	0	0.15	0.29	0.283	0.29	0.15
Nitrite as NO2	500	UK DWS	mg/l	2 of 2	0	0.18	0.58	0.56	0.18	0.58
Sulphate as SO4	250000	UK DWS	mg/l	2 of 2	0	13	62	59.550	13	62
Sulphide		No screening value	mg/l	No GAC	-	0.01	0.02	0.0195	0.02	0.01
Aliphatics >C5-6	15000	WHO DWS	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C6-8	15000	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C8-10	300	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C10-12	300	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aliphatics >C10-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C12-16	300	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aliphatics >C16-21		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C21-35		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aromatics >C5-7		UK DWS	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aromatics >C7-8	700	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aromatics >C8-10	90	LOD	ug/l	1 of 2	0	0.1	3.2	3.045	3.2	< 0.1
Aromatics >C10-12	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C12-16	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C16-21	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C21-35	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aromatics >C10-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Total Aliphatics and Aromatics C10-C44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Benzene	1	UK DWS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Toluene	74	EQS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Ethylbenzene	300	WHO DWS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Xylene	30	EQS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Acenaphthene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Acenaphthylene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Anthracene	0.1	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.017	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo (g,h,i) perylene	0.00082	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	0.017	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Chrysene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Dibenz-a-h-anthracene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Fluoranthene		No screening value	ug/l	No GAC	-	0.01	0.01	0.01	< 0.01	< 0.01
Fluorene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	< 0.01	0.01
Indeno(1,2,3-cd)pyrene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Naphthalene	130	EQS	ug/l	0 of 2	0	0.05	0.05	0.05	< 0.05	< 0.05
Pah, Total	0.01	UK DWS	ug/l	0 of 2	0	0.2	0.2	0.2	< 0.20	< 0.20
Phenanthrene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	< 0.01	0.01
Pyrene	0.01	LOD	ug/l	2 of 2	1	0.01	0.02	0.0195	0.01	0.02
Phenol (Monohydric)		No screening value	mg/l	No GAC	-	0.1	0.1	0.1	< 0.1	< 0.1



Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1

Hole Ref	BH BB007	BH BB013
Sample Ref	100	100
Easting	399265.479	399597.93
Northing	513764.206	513848.958
Hole Elevation (mOD)		
Sample Depth (mbgl)	4.45	2.85
Piezometer top (mbgl)		
Piezometer base (mbgl)		
Sample Date	30/03/21	30/03/21
Investigation	4322C	4322C
Aquifer		

Contaminant Name	GAC	GAC Source	Units	Total >	Total >	Min	Max	95th %ile			
				LOD	GAC						
Copper	2	DWS	mg/l	2 of 2	0	0.0022	0.0024	0.00239		0.0024	0.0022
Zinc	0.0109	EQS	mg/l	2 of 2	1	0.0061	0.012	0.01171		0.012	0.0061
Ammoniacal Nitrogen as N	0.5	DWS	mg/l	1 of 2	0	0.015	0.069	0.0663		0.069	< 0.015
Pyrene	0.01	LOD	ug/l	2 of 2	1	0.01	0.02	0.0195		0.01	0.02

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	SW BB001	SWBB002
Sample Ref	100	100
Easting		
Northing		
Hole Elevation (mOD)		
Sample Depth (mbgl)	0.00	0.00
Piezometer top (mbgl)		
Piezometer base (mbgl)		
Sample Date	30/03/21	30/03/21
Investigation	4322C	4322C
Aquifer		

Contaminant Name	GAC	GAC Source	Units	Total >		Min	Max	95th %ile		
				LOD	GAC					
Arsenic	0.01	UK DWS	mg/l	0 of 2	0	0.001	0.001	0.001	< 0.001	< 0.001
Cadmium	0.00045	EQS	mg/l	0 of 2	0	0.0001	0.0001	0.0001	< 0.0001	< 0.0001
Calcium		No screening value	mg/l	No GAC	-	8.6	9.9	9.835	8.6	9.9
Trivalent Chromium		No screening value	mg/l	No GAC	-	<0.001	<0.001	0.001	< 0.001	<0.001
Chromium - Hexavalent	3.4	EQS	mg/l	0 of 2	0	0.007	0.007	0.007	< 0.007	< 0.007
Copper	0.001	EQS	mg/l	2 of 2	0	0.0009	0.001	0.001	0.0009	0.0010
Iron (Soluble)		No screening value	mg/l	No GAC	-	0.52	0.55	0.5485	0.55	0.52
Lead	0.05	UK DWS	mg/l	2 of 2	0	0.001	0.001	0.001	0.0010	0.001
Mercury	0.00007	EQS	mg/l	0 of 2	0	<0.0001	<0.0001	0.0001	<0.0001	< 0.0001
Nickel	0.02	UK DWS	mg/l	2 of 2	0	0.001	0.001	0.001	0.0010	0.0010
Potassium		No screening value	mg/l	No GAC	-	0.54	0.61	0.6065	0.54	0.61
Selenium	0.01	UK DWS	mg/l	2 of 2	0	0.0003	0.004	0.00382	0.0003	0.004
Sodium	200	UK DWS	mg/l	2 of 2	0	4.8	5	4.990	4.8	5.0
Zinc	0.0109	EQS	mg/l	2 of 2	0	0.0057	0.0061	0.00608	0.0057	0.0061
pH		No screening value	pH Units	No GAC	-	7	7.4	7.380	7.4	7.0
Total Alkalinity as CaCO3		No screening value	mg/l	No GAC	-	21	24	23.850	21	24
BOD (total, 5 day)		No screening value	mg/l	No GAC	-	16	23	22.650	16	23
Chemical oxygen demand		No screening value	mg/l	No GAC	-	31	32	31.950	32	31
Cyanide Free		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02	< 0.02
Dissolved Organic Carbon		No screening value	mg/l	No GAC	-	8.5	10	9.925	8.5	10
Total hardness		No screening value	mg/l	No GAC	-	25	28.7	28.515	25.0	28.7
Solids, Suspended		No screening value	mg/l	No GAC	-	5	5	5.0	<5.0	<5.0
Un-Ionised Ammonia		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02	< 0.02
Ammoniacal Nitrogen as N	0.04	EQS	mg/l	0 of 2	0	0.015	0.015	0.015	< 0.015	< 0.015
Chloride	250000	UK DWS	mg/l	2 of 2	0	11	11	11.0	11	11
Nitrate as NO3	50000	UK DWS	mg/l	2 of 2	0	0.81	1.2	1.181	0.81	1.2
Nitrite as NO2	500	UK DWS	mg/l	0 of 2	0	0.1	0.1	0.1	<0.1	<0.10
Sulphate as SO4	250000	UK DWS	mg/l	2 of 2	0	3	3.7	3.665	3.7	3.0
Sulphide		No screening value	mg/l	No GAC	-	0.002	0.02	0.0191	0.02	0.002
Aliphatics >C5-6	15000	WHO DWS	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C6-8	15000	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C8-10	300	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aliphatics >C10-12	300	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aliphatics >C10-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C12-16	300	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aliphatics >C16-21		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C21-35		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aliphatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aromatics >C5-7	1	UK DWS	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aromatics >C7-8	700	LOD	ug/l	0 of 2	0	0.1	0.1	0.1	< 0.1	< 0.1
Aromatics >C8-10	90	LOD	ug/l	2 of 2	0	3.8	3.9	3.895	3.8	3.9
Aromatics >C10-12	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C12-16	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C16-21	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C21-35	90	LOD	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Aromatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Aromatics >C10-44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Total Aliphatics and Aromatics C10-C44		No screening value	ug/l	No GAC	-	1	1	1.0	< 1.0	< 1.0
Benzene	1	UK DWS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Toluene	74	EQS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Ethylbenzene	300	WHO DWS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Xylene	30	EQS	ug/l	0 of 2	0	1	1	1.0	< 1.0	< 1.0
Acenaphthene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Acenaphthylene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Anthracene	0.1	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.017	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo (g,h,i) perylene	0.00082	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	0.017	EQS	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Chrysene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Dibenz-a-h-anthracene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Fluoranthene		No screening value	ug/l	No GAC	-	0.01	0.01	0.01	< 0.01	< 0.01
Fluorene	0.01	LOD	ug/l	2 of 2	0	0.01	0.01	0.01	0.01	0.01
Indeno(1,2,3-cd)pyrene	0.01	LOD	ug/l	0 of 2	0	0.01	0.01	0.01	< 0.01	< 0.01
Napthalene	130	EQS	ug/l	0 of 2	0	0.05	0.05	0.05	< 0.05	< 0.05
Pah,Total	0.01	UK DWS	ug/l	0 of 2	0	0.2	0.2	0.2	< 0.20	< 0.20
Phenanthrene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Pyrene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Phenol (Monohydric)		No screening value	mg/l	No GAC	-	0.1	0.1	0.1	< 0.1	< 0.1

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1

ARUP

Hole Ref	TP BB005	BH BB005	BH BB016	BH BB017	TP BB008	TDP BB001	BH BB007	BH BB008	TP BB009	BH BB009	BH BB015	BH BB003	TP BB001	TP BB001	BH BB002	TP BB004	BH BB004
Sample Ref	3	12a	6	1	2	1	4	1	2	4	3	4	2	8	5	3	10A
Easting																	
Northing																	
Hole Elevation (mOD)																	
Sample Depth (mbgl)	0.30	3.50	1.00	0.20	0.30	0.20	1.20	0.20	0.30	1.00	0.20	0.80	0.20	2.00	1.00	0.30	2.40
Piezometer top (mbgl)																	
Piezometer base (mbgl)																	
Sample Date	03/03/21	02/03/21	03/03/21	22/02/21	22/02/21	18/02/21	24/02/21	24/02/21	18/02/21	24/02/21	24/02/21	16/02/21	15/02/21	15/02/21	22/02/21	18/02/21	22/02/21
Investigation	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C	4322C
Aquifer																	

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	95th %ile	TP BB005	BH BB005	BH BB016	BH BB017	TP BB008	TDP BB001	BH BB007	BH BB008	TP BB009	BH BB009	BH BB015	BH BB003	TP BB001	TP BB001	BH BB002	TP BB004	BH BB004
Arsenic	10	UK DWS	ug/l	9 of 17	0	<0.16	0.7	0.58	0.32	0.29	<0.16	<0.16	<0.16	<0.16	<0.16	0.28	0.18	<0.16	<0.17	0.55	0.5	0.41	0.38	0.7	<0.16
Antimony		No screening value	ug/l	No GAC	-	<0.17	0.2	0.2	0.2	<0.17	0.2	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Barium		No screening value	ug/l	No GAC	-	0.46	12	8.860	4.4	8.1	12	2.2	0.6	0.53	1.7	1.1	0.46	0.62	0.78	0.83	1.5	0.62	3.6	1.5	1.8
Cadmium	0.45	EQS	ug/l	1 of 17	0	<0.03	0.044	0.0328	0.044	<0.03	<0.03	0.044	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trivalent Chromium		No screening value	ug/l	No GAC	-	0.51	2.7	2.380	1.1	0.92	2.7	2.1	0.69	1.1	1.1	1.4	1.9	1.3	1.3	0.92	1.7	1.4	0.51	2.3	1.5
Copper	1	EQS	ug/l	17 of 17	7	0.59	3.3	2.420	0.98	0.90	0.59	0.66	1.40	1.40	1.10	2.20	1.00	1.00	1.80	1.10	3.30	0.68	0.87	1.00	0.66
Lead	10	UK DWS	ug/l	12 of 17	0	<0.09	0.47	0.35	0.47	0.19	<0.09	<0.09	0.092	0.14	0.092	0.1	<0.09	<0.09	0.29	0.17	0.32	0.13	<0.09	0.31	0.17
Mercury	0.07	EQS	ug/l	1 of 17	0	<0.01	0.015	0.011	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Molybdenum	0.5	LoD	ug/l	8 of 17	8	<1.1	6.4	4.40	1.7	6.4	<1.1	<1.1	<1.1	<1.1	3	2	<1.1	2.1	3.9	<1.1	<1.1	<1.1	1.8	2.5	
Nickel	20	UK DWS	ug/l	1 of 17	0	<0.5	0.54	0.508	0.5400	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Selenium	10	UK DWS	ug/l	4 of 17	0	<0.25	1.2	0.976	0.92	<0.25	<0.25	<0.25	<0.25	<0.25	0.55	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.32	1.2	<0.25
Zinc	10.9	EQS	ug/l	15 of 17	2	<1.3	120	32.80	<1.3	<1.3	120	4.2	4	3.9	11	3.9	3.1	2.6	2.3	4.1	7.8	2.6	4.2	4.3	1.3
Dissolved Organic Carbon		No screening value	ug/l	No GAC	-	2.7	3500	2300.0	<2000	<2000	<2000	<2000	3500	<2000	<2000	<2000	<2000	2.7	<2000	3	4.8	<2000	<2000	<2000	5.9
Chloride	2.5E+08	UK DWS	ug/l	17 of 17	0	1000	4400	3760.0	1000	2200	1200	1900	4400	3600	2200	2600	3600	3600	2700	2800	2600	3100	3200	2700	2600
Sulphate as SO4	2.5E+08	UK DWS	ug/l	17 of 17	0	1200	5200	4080.0	1200.0	3100.0	1200.0	2400.0	3800.0	2900.0	1500.0	2000.0	3000.0	3000.0	1900.0	2300.0	2600.0	2900.0	2800.0	5200.0	2400.0
Phenol (Monohydric)		No screening value	ug/l	No GAC	-	<100	<100	100.0	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1

ARUP

Hole Ref	TP BB006	BH BB013	TP BB011	TP BB014
Sample Ref	6	8	3	6
Easting				
Northing				
Hole Elevation (mOD)				
Sample Depth (mbgl)	1.00	1.00	0.30	1.20
Piezometer top (mbgl)				
Piezometer base (mbgl)				
Sample Date	16/02/21	24/02/21	24/02/21	22/02/21
Investigation	4322C	4322C	4322C	4322C
Aquifer				

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	95th %ile	TP BB006	BH BB013	TP BB011	TP BB014
Arsenic	10	UK DWS	ug/l	1 of 4	0	<0.16	0.48	0.432	0.48	<0.16	<0.16	<0.16
Antimony		No screening value	ug/l	No GAC	-	<0.17	0.17	0.17	<0.17	<0.17	<0.17	<0.17
Barium		No screening value	ug/l	No GAC	-	0.5	0.84	0.825	0.63	0.5	0.84	0.74
Cadmium	0.45	EQS	ug/l	0 of 4	0	0.03	0.03	0.03	<0.03	<0.03	<0.03	<0.03
Trivalent Chromium		No screening value	ug/l	No GAC	-	0.65	1.1	1.084	1.1	0.65	0.74	0.99
Copper	1	EQS	ug/l	3 of 4	1	0.4	1.2	1.133	0.74	0.75	1.20	<0.40
Lead	10	UK DWS	ug/l	2 of 4	0	0.09	0.17	0.1595	<0.09	0.1	0.17	<0.09
Mercury	0.07	EQS	ug/l	0 of 4	0	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	0.5	LoD	ug/l	2 of 4	2	<1.1	3.2	3.005	<1.1	1.9	3.2	<1.1
Nickel	20	UK DWS	ug/l	0 of 4	0	0.5	0.5	0.5	<0.50	<0.50	<0.50	<0.50
Selenium	10	UK DWS	ug/l	1 of 4	0	<0.25	0.33	0.318	0.33	<0.25	<0.25	<0.25
Zinc	10.9	EQS	ug/l	4 of 4	0	3.1	7.6	7.375	8.1	3.1	3.2	7.6
Dissolved Organic Carbon		No screening value	ug/l	No GAC	-	4.8	<2000	2000.0	4.8	<2000	<2000	<2000
Chloride	2.5E+08	UK DWS	ug/l	4 of 4	0	940	2600	2540.0	2600	2200	2200	940
Sulphate as SO4	2.5E+08	UK DWS	ug/l	4 of 4	0	1100	2300	2240.0	2300.0	1900.0	1600.0	1100.0
Phenol (Monohydric)		No screening value	ug/l	No GAC	-	<100	<100	100.0	<100	<100	<100	<100

H.3 Scheme 8 Human Health



Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1
Concentration exceeds saturation value but not GAC	50

Hole Ref	TP CLR015	TP CLR020	TP CLR020	TP CLR023	TP CLR023	WS CLR001	WS CLR001	WS CLR003	WS CLR005
Sample Ref	3	1	4	3	7	2	4	1	2
Eastings	406829.96	408244.182	408244.182	408247.116	408247.116	407535.917	407535.917	405120.026	407024.903
Northing	513564.681	513502.174	513502.174	513567.769	513567.769	513613.817	513613.817	513758.596	513805.629
Hole Elevation (mOD)									
Sample Depth (mbgl)	0.4	0.2	1	0.4	1.2	0.2	1	0.2	0.2
Sample Date	19/02/21	22/02/21	22/02/21	19/02/21	19/02/21	16/02/21	16/02/21	11/02/21	16/02/21
Investigation	4322D	4322D	4322D	4322D	4322D	4322D	4322D	4322D	4322D
Geology	GD	TOP	GD	GD	GD	GD	GD	TOP	TOP

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	Saturation Value	Total > Saturation
Arsenic	170	C4SL	mg/kg	35 of 35	0	4.9	9.5	0	6.3
Boron	46000	LQM S4UL	mg/kg	30 of 35	0	0.2	0.9	0	0.5
Cadmium	880	C4SL	mg/kg	35 of 35	0	0.1	0.9	0	0.6
Chromium	33000	LQM S4UL	mg/kg	35 of 35	0	9.2	340	0	12
Trivalent Chromium	33000	LQM S4UL	mg/kg	35 of 35	0	9.2	340	0	12
Chromium - Hexavalent	250	C4SL	mg/kg	0 of 35	0	1	1	0	< 1.0
Copper	44000	LQM S4UL	mg/kg	35 of 35	0	9.5	25	0	18
Lead	1300	C4SL	mg/kg	35 of 35	0	14	70	0	34
Mercury	30	LQM S4UL	mg/kg	4 of 35	0	0.05	0.07	25.8	< 0.05
Nickel	3400	LQM S4UL	mg/kg	35 of 35	0	5.2	35	0	20
Selenium	1800	LQM S4UL	mg/kg	3 of 35	0	0.5	0.7	0	< 0.5
Zinc	170000	LQM S4UL	mg/kg	35 of 35	0	40	180	0	97
Benzene	90	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	0	< 0.01
Toluene	87000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	869	< 0.01
Ethylbenzene	17000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	518	< 0.01
Xylene	17000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	0	< 0.01
Aliphatics >C5-6	95000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	304	< 0.01
Aliphatics >C6-8	150000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	144	< 0.01
Aliphatics >C8-10	14000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	78	< 0.01
Aliphatics >C10-12	21000	LQM S4UL	mg/kg	0 of 34	0	1.5	1.5	48	< 1.5
Aliphatics >C12-16	25000	LQM S4UL	mg/kg	0 of 34	0	1.2	1.2	24	< 1.2
Aliphatics >C16-21			mg/kg	No GAC	-	1.5	1.5	0	< 1.5
Aliphatics >C21-35			mg/kg	No GAC	-	3.4	3.4	0	< 3.4
Aliphatics >C35-44	450000	LQM S4UL	mg/kg	0 of 32	0	3.4	3.4	0	< 3.4
Aliphatics >C5-35			mg/kg	No GAC	-	10	10	0	< 10
Aliphatics >C10-44			mg/kg	No GAC	-	10	10	0	< 10
Aromatics >C5-7	76000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	1220	< 0.01
Aromatics >C7-8	87000	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	869	< 0.01
Aromatics >C8-10	7200	LQM S4UL	mg/kg	0 of 34	0	0.01	0.01	613	< 0.01
Aromatics >C10-12	9200	LQM S4UL	mg/kg	0 of 34	0	0.9	0.9	364	< 0.9
Aromatics >C12-16	10000	LQM S4UL	mg/kg	0 of 34	0	0.5	0.5	0	< 0.5
Aromatics >C16-21	7600	LQM S4UL	mg/kg	0 of 34	0	0.6	0.6	0	< 0.6
Aromatics >C21-35	7800	LQM S4UL	mg/kg	0 of 34	0	1.4	1.4	0	< 1.4
Aromatics >C35-44	7800	LQM S4UL	mg/kg	0 of 32	0	1.4	1.4	0	< 1.4
Aromatics >C10-44			mg/kg	No GAC	-	10	10	0	< 10
Total Aromatics C5-C35			mg/kg	No GAC	-	10	10	0	< 10
Total Aliphatics and Aromatics C5-C35			mg/kg	No GAC	-	10	10	0	< 10
Total Aliphatics and Aromatics C10-C44			mg/kg	No GAC	-	10	10	0	< 10
Acenaphthene	29000	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Acenaphthylene	29000	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Anthracene	150000	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Benzo(a)anthracene	49	LQM S4UL	mg/kg	4 of 34	0	0.03	0.1	0	< 0.03
Benzo(a)pyrene	11	LQM S4UL	mg/kg	1 of 34	0	0.03	0.1	0	< 0.03
Benzo(b)fluoranthene	13	LQM S4UL	mg/kg	4 of 34	0	0.03	0.1	0	< 0.03
Benzo(g,h,i)perylene	1400	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Benzo(k)fluoranthene	370	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Chrysene	93	LQM S4UL	mg/kg	3 of 34	0	0.03	0.1	0	< 0.03
Dibenz-a-h-anthracene	1.1	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Fluoranthene	6300	LQM S4UL	mg/kg	9 of 34	0	0.03	0.2	0	< 0.03
Fluorene	20000	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Indeno(1,2,3-cd)pyrene	150	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	0	< 0.03
Naphthalene	1200	LQM S4UL	mg/kg	0 of 34	0	0.03	0.1	76.4	< 0.03
Phenanthrene	6200	LQM S4UL	mg/kg	5 of 34	0	0.03	0.1	0	< 0.03
Pyrene	15000	LQM S4UL	mg/kg	6 of 34	0	0.03	0.15	0	< 0.03
Pah.Total			mg/kg	No GAC	-	0.1	1.6	0	< 0.10
pH			pH Units	No GAC	-	5.9	8.3	0	7.4
Sulphate as SO4			mg/kg	No GAC	-	100	2310	0	715
Sulphate as SO4			mg/l	No GAC	-	10	10	0	1940
Sulphide			mg/kg	No GAC	-	10	120	0	48
Cyanide Free			mg/kg	No GAC	-	0.1	1.2	0	0.2
Phenol (Monohydric)			mg/kg	No GAC	-	0.3	0.4	0	0.2
Loss on Ignition			%	No GAC	-	2.7	41	0	4.8
Organic matter			%	No GAC	-	0.2	4.9	0	4.3
Total Organic Carbon			%	No GAC	-	0.1	2.9	0	2.5
Asbestos (Presence of)			---	No GAC	-			0	NAD
Asbestos Analysis Comments			---	No GAC	-			0	na

H.4 Scheme 8 Controlled Waters

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	BH CLR003A
Sample Ref	100
Easting	405197.201
Northing	513775.28
Hole Elevation (mOD)	
Sample Depth (mbgl)	6.00
Piezometer top (mbgl)	
Piezometer base (mbgl)	
Sample Date	30/03/21
Investigation	4322D
Aquifer	

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	95th %ile	
Arsenic	0.01	UK DWS	mg/l	1 of 1	0	0.002	0.002	0.002	0.002
Cadmium	0.00045	EQS	mg/l	0 of 1	0	0.0001	0.0001	0.0001	< 0.0001
Calcium		No screening value	mg/l	No GAC	-	74	74	74.0	74
Trivalent Chromium	0.05	UK DWS	mg/l	0 of 1	0	0.001	0.001	0.001	< 0.001
Chromium - Hexavalent	3.4	EQS	mg/l	0 of 1	0	0.007	0.007	0.007	< 0.007
Copper	0.001	EQS	mg/l	0 of 1	0	0.0004	0.0004	0.0004	< 0.0004
Iron (Soluble)		No screening value	mg/l	No GAC	-	0.093	0.093	0.093	0.093
Lead	0.01	UK DWS	mg/l	1 of 1	0	0.0002	0.0002	0.0002	0.0002
Mercury	0.00007	EQS	mg/l	0 of 1	0	0.0001	0.0001	0.0001	< 0.0001
Nickel	0.02	UK DWS	mg/l	1 of 1	0	0.0014	0.0014	0.0014	0.0014
Potassium		No screening value	mg/l	No GAC	-	5.1	5.1	5.10	5.1
Selenium	0.01	UK DWS	mg/l	1 of 1	0	0.0004	0.0004	0.0004	0.0004
Sodium	200	UK DWS	mg/l	1 of 1	0	12	12	12.0	12
Zinc	0.0109	EQS	mg/l	1 of 1	0	0.0076	0.0076	0.0076	0.0076
pH	6.5-9.5	UK DWS	pH Units	No GAC	-	7.2	7.2	7.20	7.2
Total Alkalinity as CaCO3		No screening value	mg/l	No GAC	-	250	250	250.0	250
BOD (total, 5 day)		No screening value	mg/l	No GAC	-	6.4	6.4	6.40	6.4
Chemical oxygen demand		No screening value	mg/l	No GAC	-	12	12	12.0	12
Cyanide Free		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02
Dissolved Organic Carbon		No screening value	mg/l	No GAC	-	5.4	5.4	5.40	5.4
Total hardness		No screening value	mg/l	No GAC	-	243	243	243.0	243
Solids, Suspended		No screening value	mg/l	No GAC	-	1200	1200	1200.0	1200
Un-Ionised Ammonia		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	< 0.02
Ammoniacal Nitrogen as N	0.04	EQS	mg/l	1 of 1	1	0.042	0.042	0.042	0.042
Chloride	250000	UK DWS	mg/l	1 of 1	0	11	11	11.0	11
Nitrate as NO3	50000	UK DWS	mg/l	1 of 1	0	0.16	0.16	0.16	0.16
Nitrite as NO2	500	UK DWS	mg/l	1 of 1	0	0.21	0.21	0.21	0.21
Sulphate as SO4	250000	UK DWS	mg/l	1 of 1	0	14	14	14.0	14
Sulphide		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	0.02
Aliphatics >C5-6	15000	WHO DWS	ug/l	0 of 1	0	<0.1	<0.1	0.1	<0.1
Aliphatics >C6-8	15000	LOD	ug/l	0 of 1	0	<0.1	<0.1	0.1	<0.1
Aliphatics >C8-10	300	LOD	ug/l	0 of 1	0	<0.1	<0.1	0.1	<0.1
Aliphatics >C10-12	300	LOD	ug/l	0 of 1	0	1	1	1.0	<1.0
Aliphatics >C10-44		No screening value	ug/l	No GAC	-	88	88	88.0	88
Aliphatics >C12-16	300	LOD	ug/l	0 of 1	0	1	1	1.0	<1.0
Aliphatics >C16-21		No screening value	ug/l	No GAC	-	40	40	40.0	40
Aliphatics >C21-35		No screening value	ug/l	No GAC	-	47	47	47.0	47
Aliphatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	<1.0
Aromatics >C5-7	1	UK DWS	ug/l	0 of 1	0	<0.1	<0.1	0.1	<0.1
Aromatics >C7-8	700	LOD	ug/l	0 of 1	0	<0.1	<0.1	0.1	<0.1
Aromatics >C8-10	90	LOD	ug/l	1 of 1	0	5.1	5.1	5.10	5.1
Aromatics >C10-12	90	LOD	ug/l	0 of 1	0	1	1	1.0	<1.0
Aromatics >C12-16	90	LOD	ug/l	0 of 1	0	1	1	1.0	<1.0
Aromatics >C16-21	90	LOD	ug/l	1 of 1	0	19	19	19.0	19
Aromatics >C21-35	90	LOD	ug/l	1 of 1	0	13	13	13.0	13
Aromatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	<1.0
Aromatics >C10-44		No screening value	ug/l	No GAC	-	32	32	32.0	32
Total Aliphatics and Aromatics C10-C44		No screening value	ug/l	No GAC	-	120	120	120.0	120
Benzene	1	UK DWS	ug/l	0 of 1	0	1	1	1.0	<1.0
Toluene	74	EQS	ug/l	0 of 1	0	1	1	1.0	<1.0
Ethylbenzene	300	WHO DWS	ug/l	0 of 1	0	1	1	1.0	<1.0
Xylene	30	EQS	ug/l	0 of 1	0	1	1	1.0	<1.0
Acenaphthene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03
Acenaphthylene	0.01	LOD	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Anthracene	0.1	EQS	ug/l	1 of 1	0	0.01	0.01	0.01	0.01
Benzo(a)anthracene	0.01	LOD	ug/l	1 of 1	0	0.01	0.01	0.01	0.01
Benzo(a)pyrene	0.01	LOD	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Benzo(b)fluoranthene	0.017	EQS	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Benzo(k)fluoranthene	0.017	EQS	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Benzo (g,h,i) perylene	0.00082	EQS	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Chrysene	0.01	LOD	ug/l	1 of 1	0	0.01	0.01	0.01	0.01
Dibenz-a-h-anthracene	0.01	LOD	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Fluoranthene		No screening value	ug/l	No GAC	-	0.04	0.04	0.04	0.04
Fluorene	0.01	LOD	ug/l	1 of 1	1	0.02	0.02	0.02	0.02
Indeno(1,2,3-cd)pyrene	0.01	LOD	ug/l	0 of 1	0	<0.01	<0.01	0.01	<0.01
Napthalene	130	EQS	ug/l	1 of 1	0	0.09	0.09	0.09	0.09
Pah,Total	0.01	UK DWS	ug/l	1 of 1	1	0.27	0.27	0.27	0.27
Phenanthrene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03
Pyrene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03
Phenol (Monohydric)		No screening value	mg/l	No GAC	-	<0.1	<0.1	0.1	<0.1

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	BH CLR003A
Sample Ref	100
Easting	405197.201
Northing	513775.28
Hole Elevation (mOD)	
Sample Depth (mbgl)	0.00 -6.00
Piezometer top (mbgl)	
Piezometer base (mbgl)	
Sample Date	30/03/21
Investigation	4322D
Aquifer	

Contaminant Name	GAC	GAC Source	Units	Total > LOD	Total > GAC	Min	Max	95th %ile	
Ammoniacal Nitrogen as N	0.5	UK DWS	mg/l	1 of 1	0	0.042	0.042	0.042	0.042
Acenaphthene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03
Fluorene	0.01	LOD	ug/l	1 of 1	1	0.02	0.02	0.02	0.02
Pah, Total	0.1	UK DWS	ug/l	1 of 1	1	0.27	0.27	0.27	0.27
Phenanthrene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03
Pyrene	0.01	LOD	ug/l	1 of 1	1	0.03	0.03	0.03	0.03

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	SW CLR001	SW CLR002
Sample Ref	100	100
Easting		
Northing		
Hole Elevation (mOD)		
Sample Depth (mbgl)	0.00	0.00
Piezometer top (mbgl)		
Piezometer base (mbgl)		
Sample Date	30/03/21	30/03/21
Investigation	4322D	4322D
Aquifer		

Contaminant Name	GAC	GAC Source	Units	Total >		Min	Max	95th %ile		
				LOD	> GAC					
Arsenic	0.01	UK DWS	mg/l	0 of 2	0	<0.001	<0.001	0.001	<0.001	<0.001
Antimony										
Barium										
Cadmium	0.00045	EQS	mg/l	0 of 2	0	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Calcium		No screening value	mg/l	No GAC	-	71	71	71.0	71	71
Trivalent Chromium	0.05	No screening value	mg/l	1 of 2	0	<0.001	0.004	0.00385	<0.001	0.004
Chromium - Hexavalent	3.4	EQS	mg/l	0 of 2	0	0.007	0.007	0.007	<0.007	<0.007
Copper	0.001	EQS	mg/l	2 of 2	2	0.0014	0.0014	0.0014	0.0014	0.0014
Iron (Soluble)		No screening value	mg/l	No GAC	-	0.098	0.13	0.1284	0.098	0.13
Lead	0.05	UK DWS	mg/l	2 of 2	0	0.0002	0.0003	0.0003	0.0002	0.0003
Mercury	0.00007	EQS	mg/l	0 of 2	0	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Molybdenum	0.0005									
Nickel	0.02	UK DWS	mg/l	2 of 2	0	0.0012	0.0012	0.0012	0.0012	0.0012
Potassium		No screening value	mg/l	No GAC	-	2.3	2.5	2.490	2.5	2.3
Selenium	0.01	UK DWS	mg/l	2 of 2	0	0.0003	0.0004	0.0004	0.0004	0.0003
Sodium	200	UK DWS	mg/l	2 of 2	0	16	18	17.90	18	16
Zinc	0.0109	EQS	mg/l	2 of 2	0	0.0028	0.0036	0.00356	0.0028	0.0036
pH		UK DWS	pH Units	No GAC	-	8	8.3	8.285	8.0	8.3
Total Alkalinity as CaCO3		No screening value	mg/l	No GAC	-	170	180	179.50	170	180
BOD (total, 5 day)		No screening value	mg/l	No GAC	-	4.7	5.2	5.175	5.2	4.7
Chemical oxygen demand		No screening value	mg/l	No GAC	-	<10	15	14.750	<10	15
Cyanide Free		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	<0.02	<0.02
Dissolved Organic Carbon		No screening value	mg/l	No GAC	-	4.4	5.1	5.065	4.4	5.1
Total hardness		No screening value	mg/l	No GAC	-	197	198	197.950	197	198
Solids, Suspended		No screening value	mg/l	No GAC	-	10	35	33.750	35	10
Un-Ionised Ammonia		No screening value	mg/l	No GAC	-	0.02	0.02	0.02	<0.02	<0.02
Ammoniacal Nitrogen as N	0.04	EQS	mg/l	1 of 2	0	0.015	0.027	0.0264	0.027	<0.015
Chloride	250000	UK DWS	mg/l	2 of 2	0	39	43	42.80	43	39
Nitrate as NO3	50000	UK DWS	mg/l	2 of 2	0	6.8	7.8	7.750	7.8	6.8
Nitrite as NO2	500	UK DWS	mg/l	2 of 2	0	0.3	0.32	0.319	0.32	0.3
Sulphate as SO4	250000	UK DWS	mg/l	2 of 2	0	15	15	15.0	15	15
Sulphide		No screening value	mg/l	No GAC	-	0.01	0.02	0.0195	0.02	0.01
Aliphatics >C5-6	15000	WHO DWS	ug/l	0 of 2	0	<0.1	<0.1	0.1	<0.1	<0.1
Aliphatics >C6-8	15000	LOD	ug/l	0 of 2	0	<0.1	<0.1	0.1	<0.1	<0.1
Aliphatics >C8-10	300	LOD	ug/l	0 of 2	0	<0.1	<0.1	0.1	<0.1	<0.1
Aliphatics >C10-12	300	LOD	ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Aliphatics >C10-44		No screening value	ug/l	No GAC	-	90	90	90.0	140	90
Aliphatics >C12-16	300	LOD	ug/l	1 of 2	0	1.5	1.5	1.50	3.2	1.5
Aliphatics >C16-21		No screening value	ug/l	No GAC	-	58	58	58.0	88	58.0
Aliphatics >C21-35		No screening value	ug/l	No GAC	-	30	30	30.0	51	30
Aliphatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	<1.0	<1.0
Aromatics >C5-7	1	UK DWS	ug/l	0 of 2	0	<0.1	<0.1	0.1	<0.1	<0.1
Aromatics >C7-8	700	LOD	ug/l	0 of 2	0	<0.1	<0.1	0.1	<0.1	<0.1
Aromatics >C8-10	90	LOD	ug/l	0 of 2	0	<0.1	<0.1	0.1	5.1	<0.1
Aromatics >C10-12	90	LOD	ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Aromatics >C12-16	90	LOD	ug/l	1 of 2	0	2.7	2.7	2.70	1.2	2.7
Aromatics >C16-21	90	LOD	ug/l	1 of 2	0	33	33	33.0	40	33
Aromatics >C21-35	90	LOD	ug/l	1 of 2	0	7	7	7.0	16	7
Aromatics >C35-44		No screening value	ug/l	No GAC	-	1	1	1.0	<1.0	<1.0
Aromatics >C10-44		No screening value	ug/l	No GAC	-	42	42	42.0	57	42
Total Aliphatics and Aromatics C10-C44		No screening value	ug/l	No GAC	-	130	130	130.0	200	130
Benzene	1	UK DWS	ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Toluene	74	EQS	ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Ethylbenzene	300	WHO DWS	ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Xylene	30		ug/l	0 of 2	0	1	1	1.0	<1.0	<1.0
Acenaphthene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Acenaphthylene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Anthracene	0.1	EQS	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Benzo(a)anthracene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Benzo(a)pyrene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Benzo(b)fluoranthene	0.017	EQS	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Benzo(k)fluoranthene	0.017	EQS	ug/l	1 of 2	0	0.01	0.01	0.01	<0.01	0.01
Benzo(g,h,i)perylene	0.00082	EQS	ug/l	1 of 2	1	0.01	0.01	0.01	<0.01	0.01
Chrysene	0.01	LOD	ug/l	1 of 2	1	0.01	0.02	0.0195	<0.01	0.02
Dibenz-a-h-anthracene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	<0.01	0.01
Fluoranthene		No screening value	ug/l	No GAC	-	0.01	0.01	0.01	0.01	0.01
Fluorene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	<0.01	0.01
Indeno(1,2,3-cd)pyrene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	<0.01	0.01
Naphthalene	130	EQS	ug/l	0 of 2	0	<0.05	<0.05	0.05	<0.05	<0.05
Pah, Total	0.01	UK DWS	ug/l	0 of 2	0	0.2	0.2	0.2	<0.20	<0.20
Phenanthrene	0.01	LOD	ug/l	0 of 2	0	<0.01	<0.01	0.01	<0.01	<0.01
Pyrene	0.01	LOD	ug/l	1 of 2	0	0.01	0.01	0.01	<0.01	0.01
Phenol (Monohydric)		No screening value	mg/l	No GAC	-	<0.1	<0.1	0.1	<0.1	<0.1

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	SW CLR001	SW CLR002
Sample Ref	100	100
Easting		
Northing		
Hole Elevation (mOD)		
Sample Depth (mbgl)	0.00	0.00
Piezometer top (mbgl)		
Piezometer base (mbgl)		
Sample Date	30/03/21	30/03/21
Investigation	4322D	4322D
Aquifer		

Contaminant Name	GAC	GAC Source	Units	Total >		Min	Max	95th %ile		
				LOD	GAC					
Copper	0.001	EQS	mg/l	2 of 2	2	0.0014	0.0014	0.0014	0.0014	0.0014
Benzo (g,h,i) perylene	0.00082	EQS	ug/l	1 of 2	1	0.01	0.01	0.01	< 0.01	0.01
Chrysene	0.01	LOD	ug/l	1 of 2	1	0.01	0.02	0.0195	< 0.01	0.02

Scheme 8 - Cross Lanes to Rokeby - CWRA Tier 2 Leachate

Concentration exceeds GAC	100.00
Limit of Detection value exceeds GAC	<0.1



Hole Ref	TP CLR013	TP CLR020	TP CLR009	TP CLR005
Sample Ref				
Easting				
Northing				
Hole Elevation (mOD)				
Sample Depth (mbgl)	0.20	0.20	1.20	1.20
Piezometer top (mbgl)				
Piezometer base (mbgl)				
Sample Date	22/03/21	03/03/21	03/03/21	03/03/21
Investigation	4322D	4322D	4322D	4322D
Aquifer				

Contaminant Name	GAC	GAC Source	Units	Total >		Min	Max	95th %ile					
				LOD	> GAC				TOP	TOP	GD	GD	
Arsenic	10	UK DWS	ug/l	1 of 4	0	<0.16	0.19	0.1855	0.19	<0.16	<0.16	<0.16	<0.16
Antimony			ug/l	No GAC	-	<0.017	<0.17	0.14705	<0.17	<0.017	<0.017	<0.017	<0.017
Barium		UK DWS	ug/l	No GAC	-	<0.26	4.1	3.770	4.1	1.9	1.1	<0.26	<0.26
Cadmium	0.45	EQS	ug/l	0 of 4	0	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Chromium	50	UK DWS	ug/l	3 of 4	0	<0.25	1.8	1.770	0.43	1.6	1.8	<0.25	<0.25
Copper	1	EQS	ug/l	2 of 4	2	0.4	2.4	2.205	2.4	1.1	<0.40	<0.40	<0.40
Lead	10	UK DWS	ug/l	2 of 4	0	0.09	1.8	1.568	0.25	1.8	<0.090	<0.090	<0.090
Mercury	0.07	EQS	ug/l	1 of 4	1	<0.01	0.26	0.2225	<0.01	0.26	<0.010	<0.010	<0.010
Molybdenum	0.5	LOD	ug/l	3 of 4	3	<1.1	4	3.685	1.2	<1.1	1.9	4	4
Nickel	20	UK DWS	ug/l	0 of 4	0	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Selenium	10	UK DWS	ug/l	1 of 4	0	<0.25	0.26	0.2585	<0.25	0.26	<0.25	<0.25	<0.25
Zinc	10.9	EQS	ug/l	4 of 4	0	1.8	4.8	4.470	2.6	4.8	1.8	2.1	2.1
Dissolved Organic Carbon		No screening value	ug/l	No GAC	-	<2000	2500	2455.0	2200	2500	<2000	<2000	<2000
Chloride	250000000	UK DWS	ug/l	4 of 4	0	1400	2100	2085.0	2100	1400	2000	1700	1700
Fluoride		EQS	ug/l	No GAC	-	<100	430	398.50	430	220	<100	<100	<100
Sulphate as SO4	250000000	UK DWS	pH Units	4 of 4	0	1400	1500	1500.0	1400	1500	1500	1400	1400
Total Dissolved Solids		No screening value	ug/l	No GAC	-	13000	19000	19000.0	19000	14000	13000	19000	19000
Phenol Index		No screening value	ug/l	No GAC	-	<100	<100	100.0	<100	<100	<100	<100	<100

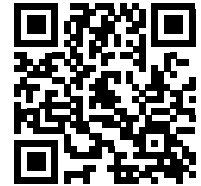
I Waste Hazard Assessment Certificates

I.1 Scheme 7 HazWaste Assessment

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



D1W97-RE45X-R9JOB

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 7 - MG

Description/Comments

Preliminary waste classification of earthworks arisings

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 7

Classified by

Name: **Rachel Boyle**
 Date: **16 Aug 2021 15:24 GMT**
 Telephone: **0121 213 3000**

Company: **Ove Arup**
The Arup Campus Blythe Valley Park
Solihull
B90 8AE

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP BB001/0.20/2021-02-01	0.2	Non Hazardous		3
2	BH BB002/0.30/2021-02-01	0.3	Non Hazardous		5
3	BH BB002/1.00/2021-02-01	1.0	Non Hazardous		8
4	TP BB006/0.20/2021-02-03	0.2	Non Hazardous		10
5	BH BB003/0.20/2021-02-03	0.2	Non Hazardous		12
6	BH BB010/0.20/2021-02-08	0.2	Non Hazardous		14
7	BH BB010/0.40/2021-02-08	0.4	Non Hazardous		16
8	BH BB011/0.20/2021-02-08	0.2	Non Hazardous		18
9	BH BB012/0.20/2021-02-08	0.2	Non Hazardous		20
10	TP BB011/0.30/2021-02-08	0.3	Non Hazardous		22
11	TP BB009/0.30/2021-02-05	0.3	Non Hazardous		24
12	BH BB004 9/02/2021	0.5	Non Hazardous		26
13	TP BB005 18/02/2021	0.3	Non Hazardous		28
14	WS BB002 22/02/2021	0.2	Non Hazardous		30
15	WS BB002 1.0 22/02/2021	1.0	Non Hazardous		32

Related documents

#	Name	Description
1	21-03213.hwol	.hwol file used to create the Job
2	21-03341.hwol	.hwol file used to create the Job
3	21-05401.hwol	.hwol file used to create the Job
4	21-05421.hwol	.hwol file used to create the Job
5	21-05426.hwol	.hwol file used to create the Job
6	21-05428.hwol	.hwol file used to create the Job
7	21-06838.hwol	.hwol file used to create the Job
8	21-02703.hwol	.hwol file used to create the Job
9	21-02324.hwol	.hwol file used to create the Job
10	21-02729.hwol	.hwol file used to create the Job
11	21-02875.hwol	.hwol file used to create the Job
12	21-02882.hwol	.hwol file used to create the Job

#	Name	Description
13	21-03041.hwol	.hwol file used to create the Job
14	21-03153.hwol	.hwol file used to create the Job
15	21-03154.hwol	.hwol file used to create the Job
16	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job


Report

Created by: Rachel Boyle

Created date: 16 Aug 2021 15:24 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	34
Appendix B: Rationale for selection of metal species	36
Appendix C: Version	36

Classification of sample: TP BB001/0.20/2021-02-01

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB001/0.20/2021-02-01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.5 mg/kg		6.5 mg/kg	0.00065 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				38 mg/kg	1.126	42.784 mg/kg	0.00428 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	130 mg/kg		130 mg/kg	0.013 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.13 mg/kg		0.13 mg/kg	0.000013 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				9.4 mg/kg	2.806	26.372 mg/kg	0.00264 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				89 mg/kg	1.245	110.78 mg/kg	0.0111 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				5.9 pH		5.9 pH	5.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.9 mg/kg	1.884	1.696 mg/kg	0.00017 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-052-00-2	202-049-5	91-20-3								
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-912-4	206-44-0								
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-927-3	129-00-0								
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				0.6 mg/kg		0.6 mg/kg	0.00006 %			
			P1186								
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	602-039-00-4	215-648-1	1336-36-3								
Total:									0.0361 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB002/0.30/2021-02-01

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB002/0.30/2021-02-01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				1.2 mg/kg		1.2 mg/kg	0.00012 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.8 mg/kg	0.00008 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				2.1 mg/kg	1.462	3.069 mg/kg	0.000307 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				6.6 mg/kg	1.126	7.431 mg/kg	0.000743 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	12 mg/kg		12 mg/kg	0.0012 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				4.3 mg/kg	2.806	12.064 mg/kg	0.00121 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				64 mg/kg	1.245	79.662 mg/kg	0.00797 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				8.1 pH		8.1 pH	8.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				69 mg/kg		69 mg/kg	0.0069 %		
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-052-00-2	202-049-5	91-20-3								
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-912-4	206-44-0								
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-927-3	129-00-0								
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %			
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				0.03 mg/kg		0.03 mg/kg	0.000003 %			
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.019 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No evidence of free-phase unlikely to be flammable HP3(i) below 1000mg/kg

Hazard Statements hit:

Fam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0069%)

Classification of sample: BH BB002/1.00/2021-02-01

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB002/1.00/2021-02-01	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				3.3 mg/kg		3.3 mg/kg	0.00033 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				6.1 mg/kg	1.462	8.915 mg/kg	0.000892 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	30 mg/kg		30 mg/kg	0.003 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				12 mg/kg	2.806	33.667 mg/kg	0.00337 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				66 mg/kg	1.245	82.151 mg/kg	0.00822 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				8.4 pH		8.4 pH	8.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
		205-912-4	206-44-0							
26	pyrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.02 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB006/0.20/2021-02-03

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB006/0.20/2021-02-03	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				10 mg/kg		10 mg/kg	0.001 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10 mg/kg	1.462	14.616 mg/kg	0.00146 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				28 mg/kg	1.126	31.525 mg/kg	0.00315 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24 mg/kg		24 mg/kg	0.0024 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				20 mg/kg	2.806	56.111 mg/kg	0.00561 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				94 mg/kg	1.245	117.003 mg/kg	0.0117 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				8.1 pH		8.1 pH	8.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1]	95-47-6 [1]								
		203-396-5 [2]	106-42-3 [2]								
		203-576-3 [3]	108-38-3 [3]								
		215-535-7 [4]	1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-052-00-2	202-049-5	91-20-3								
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				0.11 mg/kg		0.11 mg/kg	0.000011 %			
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				0.2 mg/kg		0.2 mg/kg	0.00002 %			
		205-912-4	206-44-0								
26	pyrene				0.16 mg/kg		0.16 mg/kg	0.000016 %			
		204-927-3	129-00-0								
27	benzo[a]anthracene				0.06 mg/kg		0.06 mg/kg	0.000006 %			
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				0.06 mg/kg		0.06 mg/kg	0.000006 %			
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %			
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				0.03 mg/kg		0.03 mg/kg	0.000003 %			
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.0275 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB003/0.20/2021-02-03

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB003/0.20/2021-02-03	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

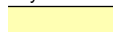



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic }				85	mg/kg		85	mg/kg	0.0085 %		
	033-001-00-X	231-148-6	7440-38-2									
2	boron { diboron trioxide; boric oxide }				0.7	mg/kg	3.22	2.254	mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				45	mg/kg	1.126	50.665	mg/kg	0.00507 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	110	mg/kg		110	mg/kg	0.011 %		
	082-001-00-6											
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.08	mg/kg		0.08	mg/kg	0.000008 %		
	080-002-00-6											
9	nickel { dinickel hexacyanoferrate }				23	mg/kg	2.806	64.528	mg/kg	0.00645 %		
	028-037-00-8	238-946-3	14874-78-3									
10	selenium { nickel(II) selenite }				<0.5	mg/kg	2.351	<1.176	mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9									
11	zinc { zinc oxide }				390	mg/kg	1.245	485.438	mg/kg	0.0485 %		
	030-013-00-7	215-222-5	1314-13-2									
12	pH				7.7	pH		7.7	pH	7.7 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1]	95-47-6 [1]								
		203-396-5 [2]	106-42-3 [2]								
		203-576-3 [3]	108-38-3 [3]								
		215-535-7 [4]	1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				0.12 mg/kg		0.12 mg/kg	0.000012 %			
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				0.23 mg/kg		0.23 mg/kg	0.000023 %			
		205-912-4	206-44-0								
26	pyrene				0.19 mg/kg		0.19 mg/kg	0.000019 %			
		204-927-3	129-00-0								
27	benzo[a]anthracene				0.07 mg/kg		0.07 mg/kg	0.000007 %			
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				0.08 mg/kg		0.08 mg/kg	0.000008 %			
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				0.07 mg/kg		0.07 mg/kg	0.000007 %			
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %			
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.0845 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB010/0.20/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB010/0.20/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				7.8 mg/kg		7.8 mg/kg	0.00078 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	21.392 mg/kg	0.00214 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	38 mg/kg		38 mg/kg	0.0038 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				87 mg/kg	1.245	108.29 mg/kg	0.0108 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.4 pH		7.4 pH	7.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		205-912-4	206-44-0							
26	pyrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	sulfur { sulfur }				600 mg/kg		600 mg/kg	0.06 %		
		016-094-00-1	231-722-6							
36	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.000003 %		<LOD
			P1186							
Total:								0.0855 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB010/0.40/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB010/0.40/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m	

Hazard properties

None identified

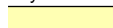



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.4 mg/kg		5.4 mg/kg	0.00054 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.2 mg/kg	1.462	10.523 mg/kg	0.00105 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	16.888 mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	14 mg/kg		14 mg/kg	0.0014 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				11 mg/kg	2.806	30.861 mg/kg	0.00309 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				56 mg/kg	1.245	69.704 mg/kg	0.00697 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				8.1 pH		8.1 pH	8.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.017 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: BH BB011/0.20/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB011/0.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

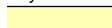



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				8.1 mg/kg		8.1 mg/kg	0.00081 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1.3 mg/kg	3.22	4.186 mg/kg	0.000419 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	40 mg/kg		40 mg/kg	0.004 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.05 mg/kg		0.05 mg/kg	0.000005 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				89 mg/kg	1.245	110.78 mg/kg	0.0111 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				6.5 pH		6.5 pH	6.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.1 mg/kg		0.1 mg/kg	0.00001 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.2 mg/kg		0.2 mg/kg	0.00002 %		
		205-912-4	206-44-0							
26	pyrene				0.16 mg/kg		0.16 mg/kg	0.000016 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.1 mg/kg		0.1 mg/kg	0.00001 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				1.8 mg/kg		1.8 mg/kg	0.00018 %		
			P1186							
Total:								0.0269 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB012/0.20/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB012/0.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.7 mg/kg		6.7 mg/kg	0.00067 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	32.651 mg/kg	0.00327 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	57 mg/kg		57 mg/kg	0.0057 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.32 mg/kg		0.32 mg/kg	0.000032 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				23 mg/kg	2.806	64.528 mg/kg	0.00645 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				1 mg/kg	2.351	2.351 mg/kg	0.000235 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				100 mg/kg	1.245	124.471 mg/kg	0.0124 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.1 pH		7.1 pH	7.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		205-912-4	206-44-0							
26	pyrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.5 mg/kg		0.5 mg/kg	0.00005 %		
			P1186							
Total:								0.0333 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB011/0.30/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB011/0.30/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6 mg/kg		6 mg/kg	0.0006 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	27.021 mg/kg	0.0027 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	26 mg/kg		26 mg/kg	0.0026 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				22 mg/kg	2.806	61.722 mg/kg	0.00617 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				76 mg/kg	1.245	94.598 mg/kg	0.00946 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.6 pH		7.6 pH	7.6 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		205-912-4	206-44-0							
26	pyrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.026 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB009/0.30/2021-02-05

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB009/0.30/2021-02-05	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.7 mg/kg		5.7 mg/kg	0.00057 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	44 mg/kg		44 mg/kg	0.0044 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				11 mg/kg	2.806	30.861 mg/kg	0.00309 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.5 mg/kg	2.351	1.176 mg/kg	0.000118 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				65 mg/kg	1.245	80.906 mg/kg	0.00809 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				5.9 pH		5.9 pH	5.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.023 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB004 9/02/2021

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB004 9/02/2021	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				3.6 mg/kg		3.6 mg/kg	0.00036 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.4 mg/kg	1.462	10.816 mg/kg	0.00108 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				13 mg/kg	1.126	14.637 mg/kg	0.00146 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		15 mg/kg	0.0015 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				82 mg/kg	1.245	102.067 mg/kg	0.0102 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.9 pH		7.9 pH	7.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	phenol				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
36	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
37	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0199 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB005 18/02/2021

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB005 18/02/2021	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.9 mg/kg		6.9 mg/kg	0.00069 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				74 mg/kg	1.126	83.316 mg/kg	0.00833 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	49 mg/kg		49 mg/kg	0.0049 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.05 mg/kg		0.05 mg/kg	0.000005 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				20 mg/kg	2.806	56.111 mg/kg	0.00561 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				190 mg/kg	1.245	236.496 mg/kg	0.0236 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.7 pH		7.7 pH	7.7 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0467 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS BB002 22/02/2021

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS BB002 22/02/2021	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.9 mg/kg		6.9 mg/kg	0.00069 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				35 mg/kg	1.126	39.406 mg/kg	0.00394 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	44 mg/kg		44 mg/kg	0.0044 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	50.5 mg/kg	0.00505 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.5 mg/kg	2.351	1.176 mg/kg	0.000118 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				110 mg/kg	1.245	136.919 mg/kg	0.0137 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				6.4 pH		6.4 pH	6.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.14 mg/kg		0.14 mg/kg	0.000014 %		
		205-912-4	206-44-0							
26	pyrene				0.11 mg/kg		0.11 mg/kg	0.000011 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0321 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: **WS BB002 1.0 22/02/2021**

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS BB002 1.0 22/02/2021	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.8 mg/kg		6.8 mg/kg	0.00068 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9 mg/kg	1.462	13.154 mg/kg	0.00132 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				33 mg/kg	1.126	37.154 mg/kg	0.00372 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	52 mg/kg		52 mg/kg	0.0052 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				21 mg/kg	2.806	58.917 mg/kg	0.00589 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc oxide }				72 mg/kg	1.245	89.619 mg/kg	0.00896 %		
	030-013-00-7	215-222-5	1314-13-2							
12	pH				7.7 pH		7.7 pH	7.7 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
20	acenaphthylene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-917-1	208-96-8							
21	acenaphthene				0.22 mg/kg		0.22 mg/kg	0.000022 %		
		201-469-6	83-32-9							
22	fluorene				0.28 mg/kg		0.28 mg/kg	0.000028 %		
		201-695-5	86-73-7							
23	phenanthrene				3.1 mg/kg		3.1 mg/kg	0.00031 %		
		201-581-5	85-01-8							
24	anthracene				0.61 mg/kg		0.61 mg/kg	0.000061 %		
		204-371-1	120-12-7							
25	fluoranthene				6.8 mg/kg		6.8 mg/kg	0.00068 %		
		205-912-4	206-44-0							
26	pyrene				5.8 mg/kg		5.8 mg/kg	0.00058 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				2.7 mg/kg		2.7 mg/kg	0.00027 %		
		601-033-00-9	200-280-6							
28	chrysene				2.4 mg/kg		2.4 mg/kg	0.00024 %		
		601-048-00-0	205-923-4							
29	benzo[b]fluoranthene				2.5 mg/kg		2.5 mg/kg	0.00025 %		
		601-034-00-4	205-911-9							
30	benzo[k]fluoranthene				0.99 mg/kg		0.99 mg/kg	0.000099 %		
		601-036-00-5	205-916-6							
31	benzo[a]pyrene; benzo[def]chrysene				1.9 mg/kg		1.9 mg/kg	0.00019 %		
		601-032-00-3	200-028-5							
32	indeno[123-cd]pyrene				0.79 mg/kg		0.79 mg/kg	0.000079 %		
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				0.22 mg/kg		0.22 mg/kg	0.000022 %		
		601-041-00-2	200-181-8							
34	benzo[ghi]perylene				1 mg/kg		1 mg/kg	0.0001 %		
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0303 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

▪ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

▪ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

▪ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

▪ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 £ conc. < 3 % , Eye Irrit. 2 H319 1 £ conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

▪ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Reasonable case CLP species based on no previous contaminative land uses, agricultural land could be present due to application of insecticide/wood preservative.

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility.

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history as site has been in agricultural land use

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight, no likely industrial source.

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Reasonable worst case - can be found in wood preservatives - no likely industrial /contaminative land use source

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water, sources can include brake pads/fungicides - no likely industrial sources due to long agricultural land use. Worst case copper sulphate is very soluble and likely to have been leached away if ever present.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Reasonable worst case as insufficient chromium VI for lead chromate to be present.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Reasonable worst case, no industrial sources as site is in agricultural usage

nickel {dinickel hexacyanoferrate}

Reasonable worst case as no industrial sources and insufficient Chromium VI for nickel chromate to be present.

selenium {nickel(II) selenite}

Next reasonable worst case, nickel selenate is soluble in water and as site is agricultural land likely to have been leached from soils if ever present.

zinc {zinc oxide}

Reasonable worst case given that there is insufficient chromium VI for zinc chromate to be present and no potential industrial sources for zinc chloride, zinc sulphate or zinc phosphate.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

sulfur {sulfur}

no contaminative land uses that could have given rise to worst case species, sulphur can be present in fertilisers, land use is mostly agricultural

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)

HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



1QUX0-O10PF-MDXKT

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 7 - Rock

Description/Comments

Preliminary waste classification of earthworks arisings

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 7

Classified by

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HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

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Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH BB018/0.70/2021-02-12		Non Hazardous		3

Related documents

#	Name	Description
1	21-03909.hwol	.hwol file used to create the Job
2	21-03800.hwol	.hwol file used to create the Job
3	21-03540.hwol	.hwol file used to create the Job
4	21-03213.hwol	.hwol file used to create the Job
5	21-03341.hwol	.hwol file used to create the Job
6	21-05401.hwol	.hwol file used to create the Job
7	21-05421.hwol	.hwol file used to create the Job
8	21-05426.hwol	.hwol file used to create the Job
9	21-05428.hwol	.hwol file used to create the Job
10	21-06838.hwol	.hwol file used to create the Job
11	21-02703.hwol	.hwol file used to create the Job
12	21-02324.hwol	.hwol file used to create the Job
13	21-02729.hwol	.hwol file used to create the Job
14	21-02875.hwol	.hwol file used to create the Job
15	21-02882.hwol	.hwol file used to create the Job
16	21-03041.hwol	.hwol file used to create the Job
17	21-03153.hwol	.hwol file used to create the Job
18	21-03154.hwol	.hwol file used to create the Job
19	21-05403.hwol	.hwol file used to create the Job
20	21-04245.hwol	.hwol file used to create the Job
21	21-04233.hwol	.hwol file used to create the Job
22	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job


Report

Created by: Rachel Boyle

Created date: 16 Aug 2021 09:24 GMT

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Appendix B: Rationale for selection of metal species	7
Appendix C: Version	7

Classification of sample: BH BB018/0.70/2021-02-12

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: BH BB018/0.70/2021-02-12	LoW Code: Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites) 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
	Entry:	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.1 mg/kg		6.1 mg/kg	0.00061 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20 mg/kg	1.462	29.231 mg/kg	0.00292 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	30.399 mg/kg	0.00304 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21 mg/kg		21 mg/kg	0.0021 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				28 mg/kg	2.806	78.556 mg/kg	0.00786 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				88 mg/kg	1.316	115.793 mg/kg	0.0116 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				8.4 pH		8.4 pH	8.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0303 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015■ **trizinc diphosphide; zinc phosphide** (EC Number: 215-244-5, CAS Number: 1314-84-7)

CLP index number: 015-006-00-9

Description/Comments:

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): Water-react. 1 H260 >= 0.6 % , EUH032 >= 0.6 % , EUH029 >= 0.6 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - Water-react. 1 H260 >= 0.6 % hazard statement sourced from: WM3, Table C3.2

14 Dec 2015 - EUH032 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

14 Dec 2015 - EUH029 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 £ conc. < 3 % , Eye Irrit. 2 H319 1 £ conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Reasonable case CLP species based on no previous contaminative land uses, agricultural land could be present due to application of insecticide/wood preservative.

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Reasonable worst case as insufficient chromium VI for lead chromate to be present.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Reasonable worst case, no industrial sources as site is in agricultural usage

nickel {dinickel hexacyanoferrate}

Reasonable worst case as no industrial sources and insufficient Chromium VI for nickel chromate to be present.

selenium {nickel(II) selenite}

Next reasonable worst case, nickel selenate is soluble in water and as site is agricultural land likely to have been leached from soils if ever present.

zinc {trizinc diphosphide; zinc phosphide}

Reasonable worst case given that there is insufficient chromium VI for zinc chromate to be present and no potential industrial sources for zinc chloride, zinc sulphate or zinc phosphate.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)

HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



2VIZU-MIJ5H-Z7WBD

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 7 - Glacial Deposits

Description/Comments

Preliminary waste classification of earthworks arisings

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 7

Classified by

Name: **Rachel Boyle**
 Date: **16 Aug 2021 15:14 GMT**
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 Company: **Ove Arup**
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HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP BB010/1.00/2021-02-04	1.0	Non Hazardous		3
2	TP BB001/2.00/2021-02-01	2.0	Non Hazardous		5
3	BH BB002/3.00/2021-02-01	3.0	Non Hazardous		7
4	TP BB004/0.30/2021-02-03	0.3	Non Hazardous		9
5	TP BB004/2.50/2021-02-03	2.5	Non Hazardous		11
6	TP BB006/1.00/2021-02-03	1.0	Non Hazardous		13
7	TP BB007/0.40/2021-02-03	0.4	Non Hazardous		15
8	TP BB007/1.00/2021-02-03	1.0	Non Hazardous		17
9	BH BB007/0.20/2021-02-08	0.2	Non Hazardous		19
10	BH BB007/1.20/2021-02-08	1.2	Non Hazardous		21
11	BH BB008/0.20/2021-02-08	0.2	Non Hazardous		23
12	BH BB008/0.60/2021-02-08	0.6	Non Hazardous		25
13	BH BB009/0.20/2021-02-08	0.2	Non Hazardous		27
14	BH BB009/1.00/2021-02-08	1.0	Non Hazardous		29
15	BH BB013/0.20/2021-02-08	0.2	Non Hazardous		31
16	BH BB013/1.00/2021-02-08	1.0	Non Hazardous		34
17	BH BB015/0.20/2021-02-08	0.2	Non Hazardous		36
18	TP BB011/1.20/2021-02-08	1.2	Non Hazardous		38
19	WS BB001/0.80/2021-02-08	0.8	Non Hazardous		40
20	TP BB008/0.30/2021-02-05	0.3	Non Hazardous		42
21	TP BB009/1.00/2021-02-05	1.0	Non Hazardous		44
22	BH BB021/0.20/2021-02-11	0.2	Non Hazardous		46
23	TP BB012/0.30/2021-02-09	0.3	Non Hazardous		48
24	TP BB013/0.30/2021-02-09	0.3	Non Hazardous		50
25	BH BB014/0.10/2021-02-12	0.1	Non Hazardous		52
26	BH BB020/0.20/2021-02-12	0.2	Non Hazardous		54
27	BH BB025/0.20/2021-02-22	0.2	Non Hazardous		56
28	BH B0024/0.20/2021-02-23	0.2	Non Hazardous		58
29	TP BB002/0.40/2021-02-23	0.4	Non Hazardous		60

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
30	TP BB002/2.00/2021-02-23	2.0	Non Hazardous		62
31	BH BB006/0.20/2021-02-19	0.2	Non Hazardous		64
32	BH BB006/1.70	1.7	Non Hazardous		66
33	TP BB005/1.20/2021-02-18	1.2	Non Hazardous		68
34	TP BB014/0.40/2021-02-18	0.4	Non Hazardous		70
35	TP BB014/1.20/2021-02-18	1.2	Non Hazardous		72
36	BH BB004/2.4	2.4	Non Hazardous		74
37	BH BB005/3.50/2021-02-19	3.5	Non Hazardous		76
38	BH BB023/0.20/2021-02-16	0.2	Non Hazardous		78
39	BH BB023/1.00/2021-02-16	1.0	Non Hazardous		80
40	BH BB026/0.20/2021-02-16	0.2	Non Hazardous		82
41	BH BB022/0.20/2021-02-19	0.2	Non Hazardous		84
42	BH BB016/1.0	1.0	Non Hazardous		86

Related documents

#	Name	Description
1	21-03213.hwol	.hwol file used to create the Job
2	21-03341.hwol	.hwol file used to create the Job
3	21-05401.hwol	.hwol file used to create the Job
4	21-05421.hwol	.hwol file used to create the Job
5	21-05426.hwol	.hwol file used to create the Job
6	21-05428.hwol	.hwol file used to create the Job
7	21-06838.hwol	.hwol file used to create the Job
8	21-02703.hwol	.hwol file used to create the Job
9	21-02324.hwol	.hwol file used to create the Job
10	21-02729.hwol	.hwol file used to create the Job
11	21-02875.hwol	.hwol file used to create the Job
12	21-02882.hwol	.hwol file used to create the Job
13	21-03041.hwol	.hwol file used to create the Job
14	21-03153.hwol	.hwol file used to create the Job
15	21-03154.hwol	.hwol file used to create the Job
16	21-05403.hwol	.hwol file used to create the Job
17	21-04245.hwol	.hwol file used to create the Job
18	21-04233.hwol	.hwol file used to create the Job
19	21-03909.hwol	.hwol file used to create the Job
20	21-03800.hwol	.hwol file used to create the Job
21	21-03540.hwol	.hwol file used to create the Job
22	21-04131.hwol	.hwol file used to create the Job
23	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job


Report

Created by: Rachel Boyle

Created date: 16 Aug 2021 15:14 GMT

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Appendix B: Rationale for selection of metal species	90
Appendix C: Version	91

Classification of sample: TP BB010/1.00/2021-02-04

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB010/1.00/2021-02-04	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				260 mg/kg		260 mg/kg	0.026 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				9 mg/kg	1.126	10.133 mg/kg	0.00101 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		17 mg/kg	0.0017 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				46 mg/kg	1.316	60.528 mg/kg	0.00605 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.8 pH		6.8 pH	6.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0426 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: TP BB001/2.00/2021-02-01

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB001/2.00/2021-02-01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				8.4 mg/kg		8.4 mg/kg	0.00084 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	24.77 mg/kg	0.00248 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22 mg/kg		22 mg/kg	0.0022 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				28 mg/kg	2.806	78.556 mg/kg	0.00786 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				69 mg/kg	1.316	90.792 mg/kg	0.00908 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.4 pH		7.4 pH	7.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0263 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB002/3.00/2021-02-01

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB002/3.00/2021-02-01	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
3.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.1 mg/kg		4.1 mg/kg	0.00041 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.4 mg/kg	1.462	13.739 mg/kg	0.00137 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	18 mg/kg		18 mg/kg	0.0018 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				16 mg/kg	2.806	44.889 mg/kg	0.00449 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				51 mg/kg	1.316	67.107 mg/kg	0.00671 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				8.2 pH		8.2 pH	8.2 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0187 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: TP BB004/0.30/2021-02-03

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB004/0.30/2021-02-03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				240 mg/kg		240 mg/kg	0.024 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	20 mg/kg		20 mg/kg	0.002 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	50.5 mg/kg	0.00505 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				47 mg/kg	1.316	61.844 mg/kg	0.00618 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.4 pH		7.4 pH	7.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.044 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB004/2.50/2021-02-03

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB004/2.50/2021-02-03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.5 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				9.9 mg/kg		9.9 mg/kg	0.00099 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	24.77 mg/kg	0.00248 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	51 mg/kg		51 mg/kg	0.0051 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				21 mg/kg	2.806	58.917 mg/kg	0.00589 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				61 mg/kg	1.316	80.265 mg/kg	0.00803 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				8.1 pH		8.1 pH	8.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0265 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: TP BB006/1.00/2021-02-03

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB006/1.00/2021-02-03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				130 mg/kg		130 mg/kg	0.013 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.9 mg/kg	1.462	14.469 mg/kg	0.00145 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	17 mg/kg		17 mg/kg	0.0017 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	53.306 mg/kg	0.00533 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				61 mg/kg	1.316	80.265 mg/kg	0.00803 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				8.3 pH		8.3 pH	8.3 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0337 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB007/0.40/2021-02-03

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB007/0.40/2021-02-03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				160 mg/kg		160 mg/kg	0.016 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				10 mg/kg	1.126	11.259 mg/kg	0.00113 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	16 mg/kg		16 mg/kg	0.0016 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				10 mg/kg	2.806	28.056 mg/kg	0.00281 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				35 mg/kg	1.316	46.054 mg/kg	0.00461 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.5 pH		7.5 pH	7.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0299 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: TP BB007/1.00/2021-02-03

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB007/1.00/2021-02-03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				100 mg/kg		100 mg/kg	0.01 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	19.14 mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24 mg/kg		24 mg/kg	0.0024 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				36 mg/kg	2.806	101 mg/kg	0.0101 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				72 mg/kg	1.316	94.739 mg/kg	0.00947 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.8 pH		7.8 pH	7.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0382 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB007/0.20/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB007/0.20/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				8.3 mg/kg		8.3 mg/kg	0.00083 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				41 mg/kg	1.126	46.161 mg/kg	0.00462 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	110 mg/kg		110 mg/kg	0.011 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.13 mg/kg		0.13 mg/kg	0.000013 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				90 mg/kg	1.316	118.424 mg/kg	0.0118 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.1 pH		6.1 pH	6.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.5 mg/kg		0.5 mg/kg	0.00005 %		
			P1186							
Total:								0.0367 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB007/1.20/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB007/1.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.7 mg/kg		6.7 mg/kg	0.00067 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	23.644 mg/kg	0.00236 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	28 mg/kg		28 mg/kg	0.0028 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.08 mg/kg		0.08 mg/kg	0.000008 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	53.306 mg/kg	0.00533 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				63 mg/kg	1.316	82.897 mg/kg	0.00829 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.8 pH		5.8 pH	5.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0235 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB008/0.20/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB008/0.20/2021-02-08	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.2 mg/kg		6.2 mg/kg	0.00062 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1.3 mg/kg	3.22	4.186 mg/kg	0.000419 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				39 mg/kg	1.126	43.91 mg/kg	0.00439 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	120 mg/kg		120 mg/kg	0.012 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.2 mg/kg		0.2 mg/kg	0.00002 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				11 mg/kg	2.806	30.861 mg/kg	0.00309 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.6 mg/kg	2.351	1.411 mg/kg	0.000141 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				110 mg/kg	1.316	144.741 mg/kg	0.0145 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.5 pH		5.5 pH	5.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.6 mg/kg	1.884	1.13 mg/kg	0.000113 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				1 mg/kg		1 mg/kg	0.0001 %		
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0396 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB008/0.60/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB008/0.60/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.6 m		

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.3 mg/kg		6.3 mg/kg	0.00063 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				36 mg/kg	1.126	40.532 mg/kg	0.00405 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	89 mg/kg		89 mg/kg	0.0089 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.16 mg/kg		0.16 mg/kg	0.000016 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.8 mg/kg	2.351	1.881 mg/kg	0.000188 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				88 mg/kg	1.316	115.793 mg/kg	0.0116 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.8 pH		5.8 pH	5.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0334 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB009/0.20/2021-02-08

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB009/0.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

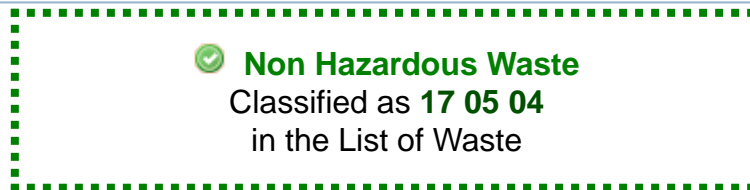
#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.7 mg/kg		6.7 mg/kg	0.00067 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1 mg/kg	3.22	3.22 mg/kg	0.000322 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				34 mg/kg	1.126	38.28 mg/kg	0.00383 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	120 mg/kg		120 mg/kg	0.012 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.24 mg/kg		0.24 mg/kg	0.000024 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				11 mg/kg	2.806	30.861 mg/kg	0.00309 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				97 mg/kg	1.316	127.635 mg/kg	0.0128 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.9 pH		5.9 pH	5.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.7 mg/kg		0.7 mg/kg	0.00007 %		
			P1186							
Total:								0.0372 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB009/1.00/2021-02-08



Sample details

Sample name:	LoW Code:	
BH BB009/1.00/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				7.7 mg/kg		7.7 mg/kg	0.00077 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35 mg/kg		35 mg/kg	0.0035 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				17 mg/kg	2.806	47.695 mg/kg	0.00477 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.6 mg/kg	2.351	1.411 mg/kg	0.000141 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				73 mg/kg	1.316	96.055 mg/kg	0.00961 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.2 pH		6.2 pH	6.2 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.3 mg/kg		0.3 mg/kg	0.00003 %		
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0256 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB013/0.20/2021-02-08

 **Non Hazardous Waste**
Classified as 17 05 04
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB013/0.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.6 mg/kg		5.6 mg/kg	0.00056 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				20 mg/kg	1.126	22.518 mg/kg	0.00225 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	76 mg/kg		76 mg/kg	0.0076 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.09 mg/kg		0.09 mg/kg	0.000009 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				8.2 mg/kg	2.806	23.006 mg/kg	0.0023 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				66 mg/kg	1.316	86.844 mg/kg	0.00868 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.2 pH		6.2 pH	6.2 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		41.2 mg/kg		41.2 mg/kg	0.00412 %		

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.028 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because No free-phase hydrocarbons recorded therefore unlikely to be flammable at <1000mg/kg

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00412%)

Classification of sample: BH BB013/1.00/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB013/1.00/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.9 mg/kg		4.9 mg/kg	0.00049 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	21.392 mg/kg	0.00214 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21 mg/kg		21 mg/kg	0.0021 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				23 mg/kg	2.806	64.528 mg/kg	0.00645 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				65 mg/kg	1.316	85.529 mg/kg	0.00855 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.9 pH		6.9 pH	6.9 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0242 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB015/0.20/2021-02-08

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB015/0.20/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.7 mg/kg		5.7 mg/kg	0.00057 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	41 mg/kg		41 mg/kg	0.0041 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				9 mg/kg	2.806	25.25 mg/kg	0.00253 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				48 mg/kg	1.316	63.16 mg/kg	0.00632 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.9 pH		5.9 pH	5.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0196 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB011/1.20/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB011/1.20/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.1 mg/kg		5.1 mg/kg	0.00051 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	27.021 mg/kg	0.0027 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24 mg/kg		24 mg/kg	0.0024 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				21 mg/kg	2.806	58.917 mg/kg	0.00589 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				110 mg/kg	1.316	144.741 mg/kg	0.0145 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.1 pH		7.1 pH	7.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1]	95-47-6 [1]								
		203-396-5 [2]	106-42-3 [2]								
		203-576-3 [3]	108-38-3 [3]								
		215-535-7 [4]	1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-912-4	206-44-0								
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-927-3	129-00-0								
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.0303 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS BB001/0.80/2021-02-08

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS BB001/0.80/2021-02-08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.8 m	

Hazard properties





None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.8 mg/kg		5.8 mg/kg	0.00058 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				12 mg/kg	1.126	13.511 mg/kg	0.00135 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	21 mg/kg		21 mg/kg	0.0021 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				16 mg/kg	2.806	44.889 mg/kg	0.00449 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				85 mg/kg	1.316	111.845 mg/kg	0.0112 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.7 pH		6.7 pH	6.7 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0226 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB008/0.30/2021-02-05

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB008/0.30/2021-02-05	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.6 mg/kg		5.6 mg/kg	0.00056 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	44 mg/kg		44 mg/kg	0.0044 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.05 mg/kg		0.05 mg/kg	0.000005 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				1 mg/kg	2.351	2.351 mg/kg	0.000235 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				95 mg/kg	1.316	125.003 mg/kg	0.0125 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.5 pH		5.5 pH	5.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0281 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB009/1.00/2021-02-05

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB009/1.00/2021-02-05	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

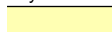



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				14 mg/kg		14 mg/kg	0.0014 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				41 mg/kg	1.126	46.161 mg/kg	0.00462 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35 mg/kg		35 mg/kg	0.0035 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				80 mg/kg	2.806	224.445 mg/kg	0.0224 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				170 mg/kg	1.316	223.69 mg/kg	0.0224 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.4 pH		5.4 pH	5.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0584 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB021/0.20/2021-02-11

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB021/0.20/2021-02-11	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

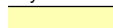



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				8.2 mg/kg		8.2 mg/kg	0.00082 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.8 mg/kg	1.142	0.914 mg/kg	0.0000914 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20 mg/kg	1.462	29.231 mg/kg	0.00292 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	24.77 mg/kg	0.00248 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	46 mg/kg		46 mg/kg	0.0046 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.11 mg/kg		0.11 mg/kg	0.000011 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				17 mg/kg	2.806	47.695 mg/kg	0.00477 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.8 mg/kg	2.351	1.881 mg/kg	0.000188 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				98 mg/kg	1.316	128.951 mg/kg	0.0129 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.9 pH		5.9 pH	5.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.031 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB012/0.30/2021-02-09

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB012/0.30/2021-02-09	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

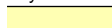



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.4 mg/kg		6.4 mg/kg	0.00064 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	44 mg/kg		44 mg/kg	0.0044 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.15 mg/kg		0.15 mg/kg	0.000015 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				7.1 mg/kg	2.806	19.92 mg/kg	0.00199 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				51 mg/kg	1.316	67.107 mg/kg	0.00671 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.6 pH		6.6 pH	6.6 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1]	95-47-6 [1]								
		203-396-5 [2]	106-42-3 [2]								
		203-576-3 [3]	108-38-3 [3]								
		215-535-7 [4]	1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-912-4	206-44-0								
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-927-3	129-00-0								
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.0192 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB013/0.30/2021-02-09

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB013/0.30/2021-02-09	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5 mg/kg		5 mg/kg	0.0005 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	57 mg/kg		57 mg/kg	0.0057 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.12 mg/kg		0.12 mg/kg	0.000012 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				7.1 mg/kg	2.806	19.92 mg/kg	0.00199 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				50 mg/kg	1.316	65.791 mg/kg	0.00658 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.4 pH		6.4 pH	6.4 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0205 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB014/0.10/2021-02-12

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB014/0.10/2021-02-12	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.1 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.4 mg/kg		4.4 mg/kg	0.00044 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1 mg/kg	3.22	3.22 mg/kg	0.000322 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				54 mg/kg	1.462	78.924 mg/kg	0.00789 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	29.273 mg/kg	0.00293 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	56 mg/kg		56 mg/kg	0.0056 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				9.3 mg/kg	2.806	26.092 mg/kg	0.00261 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				83 mg/kg	1.316	109.214 mg/kg	0.0109 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.6 pH		6.6 pH	6.6 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.9 mg/kg	1.884	1.696 mg/kg	0.00017 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.16 mg/kg		0.16 mg/kg	0.000016 %		
		205-912-4	206-44-0							
26	pyrene				0.13 mg/kg		0.13 mg/kg	0.000013 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				1.1 mg/kg		1.1 mg/kg	0.00011 %		
			P1186							
Total:								0.0331 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB020/0.20/2021-02-12

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB020/0.20/2021-02-12	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

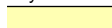



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.4 mg/kg		4.4 mg/kg	0.00044 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				10 mg/kg	1.126	11.259 mg/kg	0.00113 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22 mg/kg		22 mg/kg	0.0022 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				8.9 mg/kg	2.806	24.97 mg/kg	0.0025 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				52 mg/kg	1.316	68.423 mg/kg	0.00684 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.5 pH		6.5 pH	6.5 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD	
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-052-00-2	202-049-5	91-20-3								
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-917-1	208-96-8								
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-469-6	83-32-9								
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-695-5	86-73-7								
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		201-581-5	85-01-8								
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-371-1	120-12-7								
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-912-4	206-44-0								
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		204-927-3	129-00-0								
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-033-00-9	200-280-6	56-55-3								
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-048-00-0	205-923-4	218-01-9								
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-034-00-4	205-911-9	205-99-2								
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-036-00-5	205-916-6	207-08-9								
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-032-00-3	200-028-5	50-32-8								
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-893-2	193-39-5								
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
	601-041-00-2	200-181-8	53-70-3								
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD	
		205-883-8	191-24-2								
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD	
			P1186								
Total:									0.0179 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB025/0.20/2021-02-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB025/0.20/2021-02-22	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

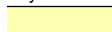



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4 mg/kg		4 mg/kg	0.0004 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.7 mg/kg	1.462	14.177 mg/kg	0.00142 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	28 mg/kg		28 mg/kg	0.0028 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				7.9 mg/kg	2.806	22.164 mg/kg	0.00222 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				53 mg/kg	1.316	69.739 mg/kg	0.00697 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.3 pH		6.3 pH	6.3 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		205-912-4	206-44-0							
26	pyrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.9 mg/kg		0.9 mg/kg	0.00009 %		
			P1186							
Total:								0.0178 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH B0024/0.20/2021-02-23

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH B0024/0.20/2021-02-23	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.8 mg/kg		4.8 mg/kg	0.00048 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.6 mg/kg	1.142	0.685 mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.1 mg/kg	1.462	13.3 mg/kg	0.00133 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	19.14 mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	41 mg/kg		41 mg/kg	0.0041 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.07 mg/kg		0.07 mg/kg	0.000007 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				9 mg/kg	2.806	25.25 mg/kg	0.00253 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				91 mg/kg	1.316	119.74 mg/kg	0.012 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.8 pH		5.8 pH	5.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5 mg/kg	1.884	0.942 mg/kg	0.0000942 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.09 mg/kg		0.09 mg/kg	0.000009 %		
		205-912-4	206-44-0							
26	pyrene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.8 mg/kg		0.8 mg/kg	0.00008 %		
			P1186							
Total:								0.0247 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB002/0.40/2021-02-23

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB002/0.40/2021-02-23	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m	

Hazard properties

None identified

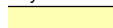



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				9.6 mg/kg		9.6 mg/kg	0.00096 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	27.021 mg/kg	0.0027 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	36 mg/kg		36 mg/kg	0.0036 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				78 mg/kg	1.316	102.634 mg/kg	0.0103 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.7 pH		7.7 pH	7.7 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.026 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB002/2.00/2021-02-23

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB002/2.00/2021-02-23	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.0 m		

Hazard properties

None identified

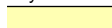



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				12 mg/kg		12 mg/kg	0.0012 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	32.651 mg/kg	0.00327 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	25 mg/kg		25 mg/kg	0.0025 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.08 mg/kg		0.08 mg/kg	0.000008 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				71 mg/kg	1.316	93.424 mg/kg	0.00934 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.9 pH		7.9 pH	7.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0249 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB006/0.20/2021-02-19

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB006/0.20/2021-02-19	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6 mg/kg		6 mg/kg	0.0006 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	30.399 mg/kg	0.00304 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	95 mg/kg		95 mg/kg	0.0095 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.13 mg/kg		0.13 mg/kg	0.000013 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				9.4 mg/kg	2.806	26.372 mg/kg	0.00264 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.5 mg/kg	2.351	1.176 mg/kg	0.000118 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				94 mg/kg	1.316	123.688 mg/kg	0.0124 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.8 pH		5.8 pH	5.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5 mg/kg	1.884	0.942 mg/kg	0.0000942 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.5 mg/kg		0.5 mg/kg	0.00005 %		
			P1186							
Total:								0.0323 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB006/1.70

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB006/1.70	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.7 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.8 mg/kg		4.8 mg/kg	0.00048 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	230 mg/kg		230 mg/kg	0.023 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				12 mg/kg	2.806	33.667 mg/kg	0.00337 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				61 mg/kg	1.316	80.265 mg/kg	0.00803 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.8 pH		6.8 pH	6.8 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.15 mg/kg		0.15 mg/kg	0.000015 %		
		201-581-5	85-01-8							
24	anthracene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		204-371-1	120-12-7							
25	fluoranthene				0.44 mg/kg		0.44 mg/kg	0.000044 %		
		205-912-4	206-44-0							
26	pyrene				0.39 mg/kg		0.39 mg/kg	0.000039 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.17 mg/kg		0.17 mg/kg	0.000017 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.19 mg/kg		0.19 mg/kg	0.000019 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.18 mg/kg		0.18 mg/kg	0.000018 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.11 mg/kg		0.11 mg/kg	0.000011 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0411 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP BB005/1.20/2021-02-18

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB005/1.20/2021-02-18	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m	

Hazard properties

None identified

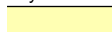



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.1 mg/kg		5.1 mg/kg	0.00051 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.8 mg/kg	1.462	14.323 mg/kg	0.00143 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	48 mg/kg		48 mg/kg	0.0048 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.5 mg/kg	2.351	1.176 mg/kg	0.000118 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				58 mg/kg	1.316	76.318 mg/kg	0.00763 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.4 pH		6.4 pH	6.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0225 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB014/0.40/2021-02-18

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB014/0.40/2021-02-18	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m	

Hazard properties

None identified

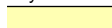



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				7.2 mg/kg		7.2 mg/kg	0.00072 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	25 mg/kg		25 mg/kg	0.0025 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				15 mg/kg	2.806	42.083 mg/kg	0.00421 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				63 mg/kg	1.316	82.897 mg/kg	0.00829 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.3 pH		6.3 pH	6.3 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0221 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP BB014/1.20/2021-02-18

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP BB014/1.20/2021-02-18	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				7.5 mg/kg		7.5 mg/kg	0.00075 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				24 mg/kg	1.126	27.021 mg/kg	0.0027 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	22 mg/kg		22 mg/kg	0.0022 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				26 mg/kg	2.806	72.945 mg/kg	0.00729 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				72 mg/kg	1.316	94.739 mg/kg	0.00947 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.5 pH		7.5 pH	7.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
		215-535-7 [4]	1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.11 mg/kg		0.11 mg/kg	0.000011 %		
		205-912-4	206-44-0							
26	pyrene				0.09 mg/kg		0.09 mg/kg	0.000009 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0266 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB004/2.4

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB004/2.4	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.4 m		

Hazard properties

None identified

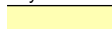



Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.2 mg/kg		4.2 mg/kg	0.00042 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	15 mg/kg		15 mg/kg	0.0015 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				18 mg/kg	2.806	50.5 mg/kg	0.00505 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				93 mg/kg	1.316	122.372 mg/kg	0.0122 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		8.1 pH		8.1 pH	8.1 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.025 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB005/3.50/2021-02-19

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB005/3.50/2021-02-19	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
3.5 m		

Hazard properties

None identified

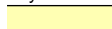



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.6 mg/kg		5.6 mg/kg	0.00056 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				4.4 mg/kg	1.462	6.431 mg/kg	0.000643 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				9.9 mg/kg	1.126	11.146 mg/kg	0.00111 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	8.3 mg/kg		8.3 mg/kg	0.00083 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				42 mg/kg	1.316	55.265 mg/kg	0.00553 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		7.9 pH		7.9 pH	7.9 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0145 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB023/0.20/2021-02-16

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB023/0.20/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

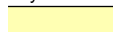



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.8 mg/kg		4.8 mg/kg	0.00048 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7 mg/kg	1.462	10.231 mg/kg	0.00102 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				12 mg/kg	1.126	13.511 mg/kg	0.00135 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	33 mg/kg		33 mg/kg	0.0033 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				4.8 mg/kg	2.806	13.467 mg/kg	0.00135 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				46 mg/kg	1.316	60.528 mg/kg	0.00605 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.9 pH		6.9 pH	6.9 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.5 mg/kg		0.5 mg/kg	0.00005 %		
			P1186							
Total:								0.0158 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB023/1.00/2021-02-16

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	BH BB023/1.00/2021-02-16	LoW Code:	
Sample Depth:	1.0 m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties





None identified

Determinands


Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.2 mg/kg		6.2 mg/kg	0.00062 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				13 mg/kg	1.126	14.637 mg/kg	0.00146 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24 mg/kg		24 mg/kg	0.0024 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	53.306 mg/kg	0.00533 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				52 mg/kg	1.316	68.423 mg/kg	0.00684 %		
	015-006-00-9	215-244-5	1314-84-7							
Total:								0.0191 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH BB026/0.20/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB026/0.20/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.5 mg/kg		4.5 mg/kg	0.00045 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.7 mg/kg	1.462	14.177 mg/kg	0.00142 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	55 mg/kg		55 mg/kg	0.0055 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				6 mg/kg	2.806	16.833 mg/kg	0.00168 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.5 mg/kg	2.351	1.176 mg/kg	0.000118 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				77 mg/kg	1.316	101.319 mg/kg	0.0101 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.5 pH		6.5 pH	6.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5 mg/kg	1.884	0.942 mg/kg	0.0000942 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.9 mg/kg		0.9 mg/kg	0.00009 %		
			P1186							
Total:								0.0235 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB022/0.20/2021-02-19

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB022/0.20/2021-02-19	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.4 mg/kg		6.4 mg/kg	0.00064 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1.4 mg/kg	3.22	4.508 mg/kg	0.000451 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				13 mg/kg	1.126	14.637 mg/kg	0.00146 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	65 mg/kg		65 mg/kg	0.0065 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				6.7 mg/kg	2.806	18.797 mg/kg	0.00188 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				79 mg/kg	1.316	103.95 mg/kg	0.0104 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		5.9 pH		5.9 pH	5.9 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5 mg/kg	1.884	0.942 mg/kg	0.0000942 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.7 mg/kg		0.7 mg/kg	0.00007 %		
			P1186							
Total:								0.0254 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB016/1.0

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB016/1.0	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

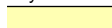



Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				13 mg/kg		13 mg/kg	0.0013 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				8.2 mg/kg	1.462	11.985 mg/kg	0.0012 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				31 mg/kg	1.126	34.903 mg/kg	0.00349 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	62 mg/kg		62 mg/kg	0.0062 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.1 mg/kg		0.1 mg/kg	0.00001 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				23 mg/kg	2.806	64.528 mg/kg	0.00645 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				130 mg/kg	1.316	171.057 mg/kg	0.0171 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH		PH		6.2 pH		6.2 pH	6.2 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group		TPH		<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<		<	<		ND
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0381 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015■ **trizinc diphosphide; zinc phosphide** (EC Number: 215-244-5, CAS Number: 1314-84-7)

CLP index number: 015-006-00-9

Description/Comments:

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): Water-react. 1 H260 >= 0.6 % , EUH032 >= 0.6 % , EUH029 >= 0.6 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - Water-react. 1 H260 >= 0.6 % hazard statement sourced from: WM3, Table C3.2

14 Dec 2015 - EUH032 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

14 Dec 2015 - EUH029 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 & conc. < 3 % , Eye Irrit. 2 H319 1 & conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

• **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Reasonable case CLP species based on no previous contaminative land uses, agricultural land could be present due to application of insecticide/wood preservative.

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Reasonable worst case as insufficient chromium VI for lead chromate to be present.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Reasonable worst case, no industrial sources as site is in agricultural usage

nickel {dinickel hexacyanoferrate}

Reasonable worst case as no industrial sources and insufficient Chromium VI for nickel chromate to be present.

selenium {nickel(II) selenite}

Next reasonable worst case, nickel selenate is soluble in water and as site is agricultural land likely to have been leached from soils if ever present.

zinc {zinc diphosphide; zinc phosphide}

Reasonable worst case given that there is insufficient chromium VI for zinc chromate to be present and no potential industrial sources for zinc chloride, zinc sulphate or zinc phosphate.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**
HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)
HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

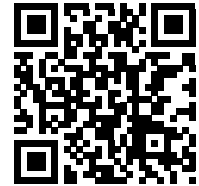
2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



FV72Z-7FI7J-5CW6B

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 7 - Topsoil

Description/Comments

Preliminary waste classification of earthworks arisings

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 7

Classified by

Name: **Rachel Boyle**
 Date: **16 Aug 2021 15:23 GMT**
 Telephone: **0121 213 3000**

Company: **Ove Arup**
The Arup Campus Blythe Valley Park
Solihull
B90 8AE

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP BB003/0.10/2021-02-04	0.1	Non Hazardous		3
2	WS BB001/0.20/2021-02-08	0.2	Non Hazardous		5
3	BH BB019/0.20/2021-02-10	0.2	Non Hazardous		7
4	BH BB017/0.20/2021-02-09	0.2	Non Hazardous		9
5	BH BB005/0.20/2021-02-18	0.2	Non Hazardous		11
6	HDP BB001	0.2	Non Hazardous		13
7	TP BB012/0.30/2021-02-09		Non Hazardous		15

Related documents

#	Name	Description
1	21-03153.hwol	.hwol file used to create the Job
2	21-03154.hwol	.hwol file used to create the Job
3	21-05403.hwol	.hwol file used to create the Job
4	21-04245.hwol	.hwol file used to create the Job
5	21-04233.hwol	.hwol file used to create the Job
6	21-03909.hwol	.hwol file used to create the Job
7	21-03800.hwol	.hwol file used to create the Job
8	21-03540.hwol	.hwol file used to create the Job
9	21-02882.hwol	.hwol file used to create the Job
10	21-03041.hwol	.hwol file used to create the Job
11	21-03213.hwol	.hwol file used to create the Job
12	21-03341.hwol	.hwol file used to create the Job
13	21-05401.hwol	.hwol file used to create the Job
14	21-05421.hwol	.hwol file used to create the Job
15	21-05426.hwol	.hwol file used to create the Job
16	21-05428.hwol	.hwol file used to create the Job
17	21-06838.hwol	.hwol file used to create the Job
18	21-02703.hwol	.hwol file used to create the Job
19	21-02324.hwol	.hwol file used to create the Job
20	21-02729.hwol	.hwol file used to create the Job
21	21-02875.hwol	.hwol file used to create the Job

#	Name	Description
22	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job


Report

Created by: Rachel Boyle

Created date: 16 Aug 2021 15:23 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	17
Appendix B: Rationale for selection of metal species	19
Appendix C: Version	20

Classification of sample: TP BB003/0.10/2021-02-04

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP BB003/0.10/2021-02-04	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.1 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				7.6 mg/kg		7.6 mg/kg	0.00076 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				26 mg/kg	1.126	29.273 mg/kg	0.00293 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	72 mg/kg		72 mg/kg	0.0072 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.06 mg/kg		0.06 mg/kg	0.000006 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				76 mg/kg	1.316	100.003 mg/kg	0.01 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7 pH		7 pH	7pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.029 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: **WS BB001/0.20/2021-02-08**

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS BB001/0.20/2021-02-08	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				4.4 mg/kg		4.4 mg/kg	0.00044 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				1 mg/kg	3.22	3.22 mg/kg	0.000322 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	41 mg/kg		41 mg/kg	0.0041 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				7.8 mg/kg	2.806	21.883 mg/kg	0.00219 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				120 mg/kg	1.316	157.899 mg/kg	0.0158 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.2 pH		6.2 pH	6.2 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.029 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB019/0.20/2021-02-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH BB019/0.20/2021-02-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6 mg/kg		6 mg/kg	0.0006 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	25.895 mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	35 mg/kg		35 mg/kg	0.0035 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	53.306 mg/kg	0.00533 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				0.7 mg/kg	2.351	1.646 mg/kg	0.000165 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				73 mg/kg	1.316	96.055 mg/kg	0.00961 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.4 pH		5.4 pH	5.4 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0261 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: BH BB017/0.20/2021-02-09

 **Non Hazardous Waste**
Classified as 17 05 04
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB017/0.20/2021-02-09	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.4 mg/kg		6.4 mg/kg	0.00064 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	23.644 mg/kg	0.00236 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	48 mg/kg		48 mg/kg	0.0048 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				14 mg/kg	2.806	39.278 mg/kg	0.00393 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				89 mg/kg	1.316	117.108 mg/kg	0.0117 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				5.6 pH		5.6 pH	5.6 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0276 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH BB005/0.20/2021-02-18

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH BB005/0.20/2021-02-18	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				5.8 mg/kg		5.8 mg/kg	0.00058 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10 mg/kg	1.462	14.616 mg/kg	0.00146 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	23.644 mg/kg	0.00236 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	41 mg/kg		41 mg/kg	0.0041 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.05 mg/kg		0.05 mg/kg	0.000005 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				12 mg/kg	2.806	33.667 mg/kg	0.00337 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				1 mg/kg	2.351	2.351 mg/kg	0.000235 %		
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { zinc diphosphide; zinc phosphide }				71 mg/kg	1.316	93.424 mg/kg	0.00934 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7 pH		7 pH	7pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0235 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: HDP BB001

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	HDP BB001	LoW Code:	
Sample Depth:	0.2 m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.8 mg/kg		6.8 mg/kg	0.00068 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	33.777 mg/kg	0.00338 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	71 mg/kg		71 mg/kg	0.0071 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.09 mg/kg		0.09 mg/kg	0.000009 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				13 mg/kg	2.806	36.472 mg/kg	0.00365 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				69 mg/kg	1.316	90.792 mg/kg	0.00908 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				7.3 pH		7.3 pH	7.3 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0284 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Classification of sample: TP BB012/0.30/2021-02-09

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: TP BB012/0.30/2021-02-09	LoW Code: Chapter: Entry:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites) 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
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Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic }				6.4 mg/kg		6.4 mg/kg	0.00064 %		
	033-001-00-X	231-148-6	7440-38-2							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	44 mg/kg		44 mg/kg	0.0044 %		
	082-001-00-6									
8	mercury { inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex }			1	0.15 mg/kg		0.15 mg/kg	0.000015 %		
	080-002-00-6									
9	nickel { dinickel hexacyanoferrate }				7.1 mg/kg	2.806	19.92 mg/kg	0.00199 %		
	028-037-00-8	238-946-3	14874-78-3							
10	selenium { nickel(II) selenite }				<0.5 mg/kg	2.351	<1.176 mg/kg	<0.000118 %		<LOD
	028-048-00-8	233-263-7	10101-96-9							
11	zinc { trizinc diphosphide; zinc phosphide }				51 mg/kg	1.316	67.107 mg/kg	0.00671 %		
	015-006-00-9	215-244-5	1314-84-7							
12	pH				6.6 pH		6.6 pH	6.6 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0192 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1** Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015■ **trizinc diphosphide; zinc phosphide** (EC Number: 215-244-5, CAS Number: 1314-84-7)

CLP index number: 015-006-00-9

Description/Comments:

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): Water-react. 1 H260 >= 0.6 % , EUH032 >= 0.6 % , EUH029 >= 0.6 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - Water-react. 1 H260 >= 0.6 % hazard statement sourced from: WM3, Table C3.2

14 Dec 2015 - EUH032 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

14 Dec 2015 - EUH029 >= 0.6 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 £ conc. < 3 % , Eye Irrit. 2 H319 1 £ conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

▪ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Reasonable case CLP species based on no previous contaminative land uses, agricultural land could be present due to application of insecticide/wood preservative.

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Reasonable worst case as insufficient chromium VI for lead chromate to be present.

mercury {inorganic compounds of mercury with the exception of mercuric sulphide and those specified elsewhere in this Annex}

Reasonable worst case, no industrial sources as site is in agricultural usage

nickel {dinickel hexacyanoferrate}

Reasonable worst case as no industrial sources and insufficient Chromium VI for nickel chromate to be present.

selenium {nickel(II) selenite}

Next reasonable worst case, nickel selenate is soluble in water and as site is agricultural land likely to have been leached from soils if ever present.

zinc {trizinc diphosphide; zinc phosphide}

Reasonable worst case given that there is insufficient chromium VI for zinc chromate to be present and no potential industrial sources for zinc chloride, zinc sulphate or zinc phosphate.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**
HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)
HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

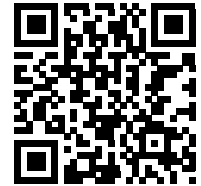
POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

I.2 Scheme 8 HazWaste Assessment

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



Y8Q3W-U7B7E-V616T

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 8 - Topsoil

Description/Comments

Preliminary classification of soil samples for scheme 8

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 8

Classified by

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 Date: **16 Aug 2021 15:56 GMT**
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Solihull
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HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH CLR010/0.20/2021-02-18	0.2	Non Hazardous		2
2	WS CLR05/0.20/2021-02-16	0.2	Non Hazardous		4
3	TP CLR011/0.20/2021-03-10	0.2	Non Hazardous		6
4	TP CLR010/0.20/2021-03-10	0.2	Non Hazardous		8
5	TP CLR013/0.20/2021-03-10	0.2	Non Hazardous		10
6	TP CLR020/0.20/2021-02-22	0.2	Non Hazardous		12
7	WS CLR003/0.20/2021-02-16	0.2	Non Hazardous		14

Related documents

#	Name	Description
1	21-03909.hwol	.hwol file used to create the Job
2	21-03899.hwol	.hwol file used to create the Job
3	21-03042.hwol	.hwol file used to create the Job
4	21-03209.hwol[2]	.hwol[2] file used to create the Job
5	21-05254.hwol	.hwol file used to create the Job
6	21-04040.hwol	.hwol file used to create the Job
7	21-03745.hwol	.hwol file used to create the Job
8	21-03521.hwol	.hwol file used to create the Job
9	Classification Report-A66 Package D Scheme 8 - all samples.pdf	Classification for Job: A66 Package D Scheme 8 - all samples
10	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job

Report

Created by: Rachel Boyle

Created date: 16 Aug 2021 15:56 GMT

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	16
Appendix B: Rationale for selection of metal species	17
Appendix C: Version	18

Classification of sample: BH CLR010/0.20/2021-02-18

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
BH CLR010/0.20/2021-02-18	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				5.6 mg/kg	1.32	7.394 mg/kg	0.000739 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.9 mg/kg	3.22	2.898 mg/kg	0.00029 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	19.14 mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	40 mg/kg	1.56	62.393 mg/kg	0.004 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				0.05 mg/kg	1.353	0.0677 mg/kg	0.00000677 %		
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				9.8 mg/kg	2.976	29.167 mg/kg	0.00292 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				76 mg/kg	2.774	210.835 mg/kg	0.0211 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				6.8 pH		6.8 pH	6.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4 mg/kg	1.884	0.754 mg/kg	0.0000754 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.3 mg/kg		0.3 mg/kg	0.00003 %		
			P1186							
Total:								0.0354 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS CLR05/0.20/2021-02-16

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS CLR05/0.20/2021-02-16	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.1	mg/kg	1.32	9.374	mg/kg	0.000937 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.8	mg/kg	3.22	2.576	mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13	mg/kg	1.462	19	mg/kg	0.0019 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	39	mg/kg	1.56	60.833	mg/kg	0.0039 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				0.06	mg/kg	1.353	0.0812	mg/kg	0.00000812 %		
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				13	mg/kg	2.976	38.691	mg/kg	0.00387 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				88	mg/kg	2.774	244.125	mg/kg	0.0244 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.3	pH		7.3	pH	7.3 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3	mg/kg	1.884	0.565	mg/kg	0.0000565 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.18 mg/kg		0.18 mg/kg	0.000018 %		
		205-912-4	206-44-0							
26	pyrene				0.13 mg/kg		0.13 mg/kg	0.000013 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0399 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR011/0.20/2021-03-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR011/0.20/2021-03-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				5.6 mg/kg	1.32	7.394 mg/kg	0.000739 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	31 mg/kg	1.56	48.354 mg/kg	0.0031 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				8.4 mg/kg	2.976	25.001 mg/kg	0.0025 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				56 mg/kg	2.774	155.352 mg/kg	0.0155 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				7.5 pH		7.5 pH	7.5 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		205-912-4	206-44-0							
26	pyrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.3 mg/kg		0.3 mg/kg	0.00003 %		
			P1186							
Total:								0.0271 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR010/0.20/2021-03-10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP CLR010/0.20/2021-03-10	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				5 mg/kg	1.32	6.602 mg/kg	0.00066 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				10 mg/kg	1.126	11.259 mg/kg	0.00113 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	31 mg/kg	1.56	48.354 mg/kg	0.0031 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				5.5 mg/kg	2.976	16.369 mg/kg	0.00164 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				40 mg/kg	2.774	110.966 mg/kg	0.0111 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				6.9 pH		6.9 pH	6.9 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0216 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR013/0.20/2021-03-10

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP CLR013/0.20/2021-03-10	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.5 mg/kg	1.32	8.582 mg/kg	0.000858 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				15 mg/kg	1.126	16.888 mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	33 mg/kg	1.56	51.474 mg/kg	0.0033 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				13 mg/kg	2.976	38.691 mg/kg	0.00387 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				68 mg/kg	2.774	188.642 mg/kg	0.0189 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				7 pH		7 pH	7pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0326 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR020/0.20/2021-02-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP CLR020/0.20/2021-02-22	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.5	mg/kg	1.32	8.582	mg/kg	0.000858 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.4	mg/kg	3.22	1.288	mg/kg	0.000129 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29	mg/kg	1.462	42.385	mg/kg	0.00424 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	70	mg/kg	1.56	109.187	mg/kg	0.007 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				0.05	mg/kg	1.353	0.0677	mg/kg	0.00000677 %		
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				68	mg/kg	2.774	188.642	mg/kg	0.0189 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.7	pH		6.7	pH	6.7 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0382 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS CLR003/0.20/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS CLR003/0.20/2021-02-16	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				7.2 mg/kg	1.32	9.506 mg/kg	0.000951 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.9 mg/kg	1.142	1.028 mg/kg	0.000103 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	21.392 mg/kg	0.00214 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	23 mg/kg	1.56	35.876 mg/kg	0.0023 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.0000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				31 mg/kg	2.976	92.264 mg/kg	0.00923 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				75 mg/kg	2.774	208.061 mg/kg	0.0208 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				7.2 pH		7.2 pH	7.2 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		205-912-4	206-44-0							
26	pyrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0393 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 £ conc. < 3 % , Eye Irrit. 2 H319 1 £ conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

- **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)

HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008**1st ATP** - Regulation 790/2009/EC of 10 August 2009**2nd ATP** - Regulation 286/2011/EC of 10 March 2011**3rd ATP** - Regulation 618/2012/EU of 10 July 2012**4th ATP** - Regulation 487/2013/EU of 8 May 2013**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013**5th ATP** - Regulation 944/2013/EU of 2 October 2013**6th ATP** - Regulation 605/2014/EU of 5 June 2014**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014**Revised List of Waste 2014** - Decision 2014/955/EU of 18 December 2014**7th ATP** - Regulation 2015/1221/EU of 24 July 2015**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018**14th ATP** - Regulation (EU) 2020/217 of 4 October 2019**15th ATP** - Regulation (EU) 2020/1182 of 19 May 2020**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)****Regulations 2019** - UK: 2019 No. 720 of 27th March 2019**The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)****Regulations 2020** - UK: 2020 No. 1567 of 16th December 2020**The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020** - UK:

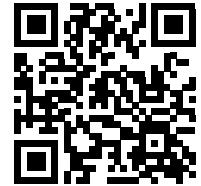
2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



GUIFJ-9ZVZO-74EOX

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

A66 Package D Scheme 8 - Glacial Deposits

Description/Comments

Preliminary classification of soil samples for scheme 8

Project

A66 Northern Trans-Pennine Dualling - Package D

Site

Scheme 8

Classified by

Name: **Rachel Boyle**
 Date: **16 Aug 2021 16:02 GMT**
 Telephone: **0121 213 3000**

Company: **Ove Arup**
The Arup Campus Blythe Valley Park
Solihull
B90 8AE

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course
 Hazardous Waste Classification

Date
 18 Jun 2019

Next 3 year Refresher due by Jun 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH CLR011/0.20/2021-02-17	0.2	Non Hazardous		3
2	TPCLR002/1.20/2021-02-10	1.2	Non Hazardous		5
3	TPCLR002/0.35/2021-02-10	0.35	Non Hazardous		7
4	TPCLR002A/0.40/2021-02-10	0.4	Non Hazardous		9
5	TPCLR003/0.30/2021-02-10	0.3	Non Hazardous		11
6	TP CLR007/1.20/2021-02-11	1.2	Non Hazardous		13
7	TP CLR012/0.40/2021-02-11	0.4	Non Hazardous		15
8	TP CLR013/1.00/2021-03-10	1.0	Non Hazardous		17
9	TP CLR020/1.00/2021-02-22	1.0	Non Hazardous		19
10	TP CLR004/0.30/2021-02-17	0.3	Non Hazardous		21
11	TP CLR004/2.20/2021-02-17	2.2	Non Hazardous		23
12	TP CLR008/0.30/2021-02-16	0.3	Non Hazardous		25
13	TP CLR008/2.40/2021-02-16	2.4	Non Hazardous		27
14	TP CLR009/0.30/2021-02-16	0.3	Non Hazardous		29
15	TP CLR009/1.20/2021-02-16	1.2	Non Hazardous		31
16	BH CLR004/0.20/2021-02-16	0.2	Non Hazardous		33
17	WS CLR001/0.20/2021-02-16	0.20	Non Hazardous		35
18	WS CLR001/1.00/2021-02-16	1.0	Non Hazardous		37
19	TP CLR001/0.30/2021-02-12	0.3	Non Hazardous		39
20	TP CLR005/0.40/2021-02-15	0.4	Non Hazardous		41
21	TP CLR005/1.20/2021-02-15	1.2	Non Hazardous		43
22	TP CLR006/0.30/2021-02-15	0.3	Non Hazardous		45
23	BH CLR001/0.20/2021-02-15	0.2	Non Hazardous		47
24	BH CLR003/0.20/2021-02-15	0.2	Non Hazardous		49
25	BH CLR003/1.00/2021-02-15	1.0	Non Hazardous		51
26	TP CLR015/0.40/2021-02-19	0.4	Non Hazardous		53
27	TP CLR023/0.40/2021-02-19	0.4	Non Hazardous		55
28	TP CLR023/1.20/2021-02-19	1.2	Non Hazardous		57

Related documents

#	Name	Description
1	21-03899.hwol	.hwol file used to create the Job
2	21-03042.hwol	.hwol file used to create the Job
3	21-03209.hwol[2]	.hwol[2] file used to create the Job
4	21-05254.hwol	.hwol file used to create the Job
5	21-04040.hwol	.hwol file used to create the Job
6	21-03745.hwol	.hwol file used to create the Job
7	21-03521.hwol	.hwol file used to create the Job
8	21-03909.hwol	.hwol file used to create the Job
9	Classification Report-A66 Package D Scheme 8 - all samples.pdf	Classification for Job: A66 Package D Scheme 8 - all samples
10	A66 Northern Trans-Pennine dualling	waste stream template used to create this Job

Report


Created by: Rachel Boyle

Created date: 16 Aug 2021 16:02 GMT

Appendices

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Classification of sample: BH CLR011/0.20/2021-02-17

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH CLR011/0.20/2021-02-17	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.8	mg/kg	1.32	8.978	mg/kg	0.000898 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.7	mg/kg	3.22	2.254	mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	51	mg/kg	1.56	79.551	mg/kg	0.0051 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				0.07	mg/kg	1.353	0.0947	mg/kg	0.00000947 %		
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				80	mg/kg	2.774	221.932	mg/kg	0.0222 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				5.9	pH		5.9	pH	5.9 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.4	mg/kg	1.884	0.754	mg/kg	0.0000754 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
		205-912-4	206-44-0							
26	pyrene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.03 mg/kg		0.03 mg/kg	0.000003 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0379 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TPCLR002/1.20/2021-02-10

 **Non Hazardous Waste**
Classified as 17 05 04
in the List of Waste

Sample details

Sample name:	LoW Code:	
TPCLR002/1.20/2021-02-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				9	mg/kg	1.32	11.883	mg/kg	0.00119 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13	mg/kg	1.462	19	mg/kg	0.0019 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	21	mg/kg	1.56	32.756	mg/kg	0.0021 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				62	mg/kg	2.774	171.997	mg/kg	0.0172 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.3	pH		7.3	pH	7.3 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.034 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TPCLR002/0.35/2021-02-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TPCLR002/0.35/2021-02-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.35 m		

Hazard properties

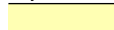



None identified

Determinands


Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.8	mg/kg	1.32	10.299	mg/kg	0.00103 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	28	mg/kg	1.56	43.675	mg/kg	0.0028 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				7.6	mg/kg	2.976	22.62	mg/kg	0.00226 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				0.7	mg/kg	2.554	1.788	mg/kg	0.000179 %		
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				46	mg/kg	2.774	127.611	mg/kg	0.0128 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.1	pH		7.1	pH	7.1 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
			P1186									
Total:										0.0233 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TPCLR002A/0.40/2021-02-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TPCLR002A/0.40/2021-02-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				4.9	mg/kg	1.32	6.47	mg/kg	0.000647 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.6	mg/kg	3.22	1.932	mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				9.5	mg/kg	1.126	10.696	mg/kg	0.00107 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	37	mg/kg	1.56	57.713	mg/kg	0.0037 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				5.2	mg/kg	2.976	15.477	mg/kg	0.00155 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				42	mg/kg	2.774	116.514	mg/kg	0.0117 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.5	pH		6.5	pH	6.5 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0229 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TPCLR003/0.30/2021-02-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TPCLR003/0.30/2021-02-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.9	mg/kg	1.32	9.11	mg/kg	0.000911 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.1	mg/kg	1.142	0.114	mg/kg	0.0000114 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13	mg/kg	1.462	19	mg/kg	0.0019 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	27	mg/kg	1.56	42.115	mg/kg	0.0027 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				9.3	mg/kg	2.976	27.679	mg/kg	0.00277 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				44	mg/kg	2.774	122.062	mg/kg	0.0122 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.2	pH		7.2	pH	7.2 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.024 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR007/1.20/2021-02-11

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR007/1.20/2021-02-11	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.2 mg/kg	1.32	8.186 mg/kg	0.000819 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	18 mg/kg	1.56	28.077 mg/kg	0.0018 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				18 mg/kg	2.976	53.573 mg/kg	0.00536 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				59 mg/kg	2.774	163.675 mg/kg	0.0164 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				8.1 pH		8.1 pH	8.1 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0301 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR012/0.40/2021-02-11

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR012/0.40/2021-02-11	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6 mg/kg	1.32	7.922 mg/kg	0.000792 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	36 mg/kg	1.56	56.153 mg/kg	0.0036 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				9.7 mg/kg	2.976	28.87 mg/kg	0.00289 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				70 mg/kg	2.774	194.19 mg/kg	0.0194 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				6.8 pH		6.8 pH	6.8 pH		
			PH							
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
			TPH							
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.09 mg/kg		0.09 mg/kg	0.000009 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.2 mg/kg		0.2 mg/kg	0.00002 %		
		205-912-4	206-44-0							
26	pyrene				0.15 mg/kg		0.15 mg/kg	0.000015 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.09 mg/kg		0.09 mg/kg	0.000009 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0325 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR013/1.00/2021-03-10

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR013/1.00/2021-03-10	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	5.6 mg/kg	1.32	7.394 mg/kg	0.000739 %		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9		1308-38-9	11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8			<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	20 mg/kg	1.56	31.196 mg/kg	0.002 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	21 mg/kg	2.976	62.502 mg/kg	0.00625 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	57 mg/kg	2.774	158.126 mg/kg	0.0158 %		
12	pH			PH	7.4 pH		7.4 pH	7.4 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
14	TPH (C6 to C40) petroleum group			TPH	<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0304 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR020/1.00/2021-02-22

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR020/1.00/2021-02-22	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.5	mg/kg	1.32	9.902	mg/kg	0.00099 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.2	mg/kg	3.22	0.644	mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				340	mg/kg	1.462	496.929	mg/kg	0.0497 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				23	mg/kg	1.126	25.895	mg/kg	0.00259 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	22	mg/kg	1.56	34.316	mg/kg	0.0022 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				25	mg/kg	2.976	74.407	mg/kg	0.00744 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				70	mg/kg	2.774	194.19	mg/kg	0.0194 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.7	pH		6.7	pH	6.7 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
16	ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1]	95-47-6 [1]							
		203-396-5 [2]	106-42-3 [2]							
		203-576-3 [3]	108-38-3 [3]							
	215-535-7 [4]	1330-20-7 [4]								
18	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
19	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
20	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
21	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-581-5	85-01-8							
23	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7							
24	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-912-4	206-44-0							
25	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-927-3	129-00-0							
26	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
27	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
28	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
29	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
30	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
31	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-893-2	193-39-5							
32	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
33	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-883-8	191-24-2							
34	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.083 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- ⚗ Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR004/0.30/2021-02-17

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR004/0.30/2021-02-17	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.7	mg/kg	1.32	8.846	mg/kg	0.000885 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	27	mg/kg	1.56	42.115	mg/kg	0.0027 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				22	mg/kg	2.976	65.478	mg/kg	0.00655 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				83	mg/kg	2.774	230.254	mg/kg	0.023 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.2	pH		7.2	pH	7.2 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.039 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR004/2.20/2021-02-17

 **Non Hazardous Waste**
Classified as 17 05 04
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR004/2.20/2021-02-17	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.6	mg/kg	1.32	10.034	mg/kg	0.001 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.5	mg/kg	3.22	1.61	mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13	mg/kg	1.462	19	mg/kg	0.0019 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	30	mg/kg	1.56	46.794	mg/kg	0.003 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				14	mg/kg	2.976	41.668	mg/kg	0.00417 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				63	mg/kg	2.774	174.771	mg/kg	0.0175 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.1	pH		6.1	pH	6.1 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0315 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR008/0.30/2021-02-16

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR008/0.30/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.7 mg/kg	1.32	8.846 mg/kg	0.000885 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.3 mg/kg	3.22	0.966 mg/kg	0.000966 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				20 mg/kg	1.126	22.518 mg/kg	0.00225 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	16 mg/kg	1.56	24.957 mg/kg	0.0016 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.0000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				20 mg/kg	2.976	59.525 mg/kg	0.00595 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				61 mg/kg	2.774	169.223 mg/kg	0.0169 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				8.1 pH		8.1 pH	8.1 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0314 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR008/2.40/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR008/2.40/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
2.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				5.8	mg/kg	1.32	7.658	mg/kg	0.000766 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.9	mg/kg	1.462	14.469	mg/kg	0.00145 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	20	mg/kg	1.56	31.196	mg/kg	0.002 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				11	mg/kg	2.976	32.739	mg/kg	0.00327 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				61	mg/kg	2.774	169.223	mg/kg	0.0169 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.2	pH		7.2	pH	7.2 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0279 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR009/0.30/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR009/0.30/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				5.3 mg/kg	1.32	6.998 mg/kg	0.0007 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	21.392 mg/kg	0.00214 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	14 mg/kg	1.56	21.837 mg/kg	0.0014 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				18 mg/kg	2.976	53.573 mg/kg	0.00536 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				56 mg/kg	2.774	155.352 mg/kg	0.0155 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				8.3 pH		8.3 pH	8.3 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.029 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR009/1.20/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR009/1.20/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.3	mg/kg	1.32	8.318	mg/kg	0.000832 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.5	mg/kg	3.22	1.61	mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13	mg/kg	1.462	19	mg/kg	0.0019 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	15.762	mg/kg	0.00158 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	33	mg/kg	1.56	51.474	mg/kg	0.0033 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				9.9	mg/kg	2.976	29.465	mg/kg	0.00295 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				64	mg/kg	2.774	177.545	mg/kg	0.0178 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.1	pH		7.1	pH	7.1 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0306 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- ⚗ Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH CLR004/0.20/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH CLR004/0.20/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	9.5 mg/kg	1.32	12.543 mg/kg	0.00125 %		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.6 mg/kg	1.142	0.685 mg/kg	0.0000685 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9		1308-38-9	15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8			<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	25 mg/kg	1.126	28.147 mg/kg	0.00281 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	26 mg/kg	1.56	40.555 mg/kg	0.0026 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	35 mg/kg	2.976	104.169 mg/kg	0.0104 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	74 mg/kg	2.774	205.287 mg/kg	0.0205 %		
12	pH			PH	7.7 pH		7.7 pH	7.7 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
14	TPH (C6 to C40) petroleum group			TPH	<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.042 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS CLR001/0.20/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS CLR001/0.20/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.7	mg/kg	1.32	8.846	mg/kg	0.000885 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.7	mg/kg	3.22	2.254	mg/kg	0.000225 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	37	mg/kg	1.56	57.713	mg/kg	0.0037 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				76	mg/kg	2.774	210.835	mg/kg	0.0211 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.5	pH		6.5	pH	6.5 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0355 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: WS CLR001/1.00/2021-02-16

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS CLR001/1.00/2021-02-16	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.1	mg/kg	1.32	8.054	mg/kg	0.000805 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11	mg/kg	1.462	16.077	mg/kg	0.00161 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	25	mg/kg	1.56	38.995	mg/kg	0.0025 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				9.9	mg/kg	2.976	29.465	mg/kg	0.00295 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				65	mg/kg	2.774	180.32	mg/kg	0.018 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7	pH		7	pH	7pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0298 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR001/0.30/2021-02-12

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR001/0.30/2021-02-12	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.3	mg/kg	1.32	9.638	mg/kg	0.000964 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.6	mg/kg	3.22	1.932	mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10	mg/kg	1.462	14.616	mg/kg	0.00146 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				20	mg/kg	1.126	22.518	mg/kg	0.00225 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	38	mg/kg	1.56	59.273	mg/kg	0.0038 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				10	mg/kg	2.976	29.763	mg/kg	0.00298 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				180	mg/kg	2.774	499.346	mg/kg	0.0499 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				6.6	pH		6.6	pH	6.6 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3	mg/kg	1.884	0.565	mg/kg	0.0000565 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				0.08 mg/kg		0.08 mg/kg	0.000008 %		
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.17 mg/kg		0.17 mg/kg	0.000017 %		
		205-912-4	206-44-0							
26	pyrene				0.12 mg/kg		0.12 mg/kg	0.000012 %		
		204-927-3	129-00-0							
27	benzo[a]anthracene				0.05 mg/kg		0.05 mg/kg	0.000005 %		
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0637 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR005/0.40/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR005/0.40/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.7	mg/kg	1.32	8.846	mg/kg	0.000885 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11	mg/kg	1.462	16.077	mg/kg	0.00161 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				11	mg/kg	1.126	12.385	mg/kg	0.00124 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	20	mg/kg	1.56	31.196	mg/kg	0.002 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				16	mg/kg	2.976	47.62	mg/kg	0.00476 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				50	mg/kg	2.774	138.707	mg/kg	0.0139 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.4	pH		7.4	pH	7.4 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0266 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR005/1.20/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR005/1.20/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				5.6	mg/kg	1.32	7.394	mg/kg	0.000739 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.5	mg/kg	3.22	1.61	mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.2	mg/kg	1.462	13.446	mg/kg	0.00134 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	18	mg/kg	1.56	28.077	mg/kg	0.0018 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				17	mg/kg	2.976	50.597	mg/kg	0.00506 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				0.7	mg/kg	2.554	1.788	mg/kg	0.000179 %		
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				65	mg/kg	2.774	180.32	mg/kg	0.018 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.9	pH		7.9	pH	7.9 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
36	polychlorobiphenyls; PCB				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
Total:								0.0312 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR006/0.30/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR006/0.30/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				7.5 mg/kg	1.32	9.902 mg/kg	0.00099 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				13 mg/kg	1.462	19 mg/kg	0.0019 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				19 mg/kg	1.126	21.392 mg/kg	0.00214 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	26 mg/kg	1.56	40.555 mg/kg	0.0026 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				25 mg/kg	2.976	74.407 mg/kg	0.00744 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				0.7 mg/kg	2.554	1.788 mg/kg	0.000179 %		
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				99 mg/kg	2.774	274.641 mg/kg	0.0275 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				7 pH		7 pH	7pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0447 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH CLR001/0.20/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH CLR001/0.20/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.9	mg/kg	1.32	9.11	mg/kg	0.000911 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.3	mg/kg	3.22	0.966	mg/kg	0.0000966 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	31	mg/kg	1.56	48.354	mg/kg	0.0031 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				7.7	mg/kg	2.976	22.917	mg/kg	0.00229 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				65	mg/kg	2.774	180.32	mg/kg	0.018 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				5.9	pH		5.9	pH	5.9 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				1.2	mg/kg	1.884	2.261	mg/kg	0.000226 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				0.4 mg/kg		0.4 mg/kg	0.00004 %		
			P1186							
Total:								0.0304 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH CLR003/0.20/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH CLR003/0.20/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				6.6 mg/kg	1.32	8.714 mg/kg	0.000871 %		
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %		
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
	024-017-00-8									
6	copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	40 mg/kg	1.56	62.393 mg/kg	0.004 %		
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				8.6 mg/kg	2.976	25.596 mg/kg	0.00256 %		
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				87 mg/kg	2.774	241.351 mg/kg	0.0241 %		
	024-007-00-3	236-878-9	13530-65-9							
12	pH				6.6 pH		6.6 pH	6.6 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.3 mg/kg	1.884	0.565 mg/kg	0.0000565 %		
	006-007-00-5									
14	TPH (C6 to C40) petroleum group				<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
16	toluene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				0.04 mg/kg		0.04 mg/kg	0.000004 %		
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0377 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: BH CLR003/1.00/2021-02-15

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH CLR003/1.00/2021-02-15	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.0 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	9.5 mg/kg	1.32	12.543 mg/kg	0.00125 %		
2	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	0.2 mg/kg	3.22	0.644 mg/kg	0.0000644 %		
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9		1308-38-9	15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8			<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	22 mg/kg	1.126	24.77 mg/kg	0.00248 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	24 mg/kg	1.56	37.436 mg/kg	0.0024 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	25 mg/kg	2.976	74.407 mg/kg	0.00744 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5	<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	70 mg/kg	2.774	194.19 mg/kg	0.0194 %		
12	pH			PH	7.4 pH		7.4 pH	7.4 pH		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
14	TPH (C6 to C40) petroleum group			TPH	<15.86 mg/kg		<15.86 mg/kg	<0.00159 %		<LOD
15	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0373 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR015/0.40/2021-02-19

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR015/0.40/2021-02-19	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.3	mg/kg	1.32	8.318	mg/kg	0.000832 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.5	mg/kg	3.22	1.61	mg/kg	0.000161 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	34	mg/kg	1.56	53.034	mg/kg	0.0034 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				20	mg/kg	2.976	59.525	mg/kg	0.00595 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				97	mg/kg	2.774	269.092	mg/kg	0.0269 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.4	pH		7.4	pH	7.4 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0432 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR023/0.40/2021-02-19

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR023/0.40/2021-02-19	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.4 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)


#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.1	mg/kg	1.32	8.054	mg/kg	0.000805 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.6	mg/kg	3.22	1.932	mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.3	mg/kg	1.142	0.343	mg/kg	0.0000343 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12	mg/kg	1.462	17.539	mg/kg	0.00175 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	20	mg/kg	1.56	31.196	mg/kg	0.002 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				18	mg/kg	2.976	53.573	mg/kg	0.00536 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				59	mg/kg	2.774	163.675	mg/kg	0.0164 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.8	pH		7.8	pH	7.8 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0306 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP CLR023/1.20/2021-02-19

 **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP CLR023/1.20/2021-02-19	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.2 m		

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				7.2	mg/kg	1.32	9.506	mg/kg	0.000951 %		
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.2	mg/kg	3.22	0.644	mg/kg	0.0000644 %		
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	21	mg/kg	1.56	32.756	mg/kg	0.0021 %		
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				26	mg/kg	2.976	77.383	mg/kg	0.00774 %		
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				72	mg/kg	2.774	199.739	mg/kg	0.02 %		
	024-007-00-3	236-878-9	13530-65-9									
12	pH				7.2	pH		7.2	pH	7.2 pH		
			PH									
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.1	mg/kg	1.884	<0.188	mg/kg	<0.0000188 %		<LOD
	006-007-00-5											
14	TPH (C6 to C40) petroleum group				<15.86	mg/kg		<15.86	mg/kg	<0.00159 %		<LOD
			TPH									
15	benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	ethylbenzene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
18	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
19	naphthalene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
20	acenaphthylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8							
21	acenaphthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9							
22	fluorene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7							
23	phenanthrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8							
24	anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7							
25	fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-912-4	206-44-0							
26	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
27	benzo[a]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-033-00-9	200-280-6	56-55-3							
28	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
29	benzo[b]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
30	benzo[k]fluoranthene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
31	benzo[a]pyrene; benzo[def]chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
32	indeno[123-cd]pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-893-2	193-39-5							
33	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
34	benzo[ghi]perylene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		205-883-8	191-24-2							
35	monohydric phenols				<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
			P1186							
Total:								0.0379 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 £ conc. < 3 % , Eye Irrit. 2 H319 1 £ conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

- **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: Note conversion factor based on a worst case compound: sodium cyanide

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2021.222.4848.9214 (10 Aug 2021)

HazWasteOnline Database: 2021.222.4848.9214 (10 Aug 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

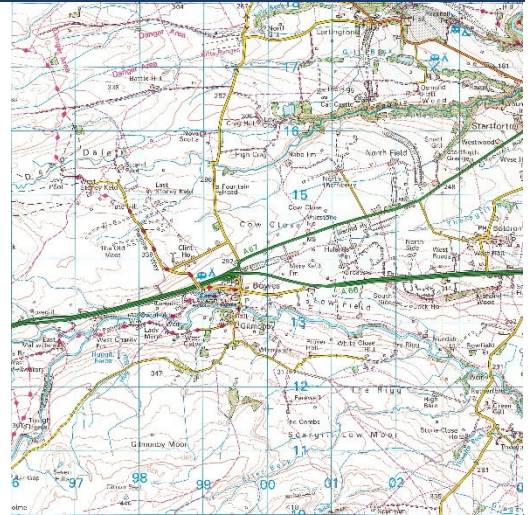
Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

J Ground investigation Factual Report

A66 NORTH TRANS PENNINE SCHEME D SECTION 7



Final Factual Report
(Rev.00)

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Geotechnics Ltd.**

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Client: AMEY OW Limited
Consulting Engineer: Arup

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REPORT CONTROL SHEET

Contract Details

Contract Title	A66 North Trans Pennine Scheme D Section 7
Contract Number	4322C
Location	Bowes Bypass
National Grid Reference	Between NY 984 135 and NZ 015 136

Report Details

Report Status	Final (Rev.00)		
Report Type	Factual		
Volume Number	1	of	1
Copy Number	PDF	of	PDF
Report Recipient	Robert Nuthall	Arup	

Client/Consultant Engineer Details

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A66 NORTH TRANS PENNINE SCHEME D SECTION 7

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APPENDICES:

Specialist Chemical Testing (Tested Externally)	Appendix I
Archaeological Monitoring Report	Appendix II

Abbreviation	Definition
CP	Cable Percussion
RC	Rotary Coring
RO	Rotary Openhole
WLS	Windowless Sampling

Text Abbreviations

1. INTRODUCTION

The investigation works were commissioned in order to determine the ground and groundwater conditions on site on the A66 at Bowes, Barnard Castle prior to the proposed works.

Allied Exploration & Geotechnics Limited (AEG) were contracted by AMEY OW Limited with Arup acting in the capacity of Consulting Engineer to perform a ground investigation at this site in order to provide information on the subsurface ground and groundwater conditions as well as to obtain samples for geotechnical and specialist chemical testing.

1.1 Scope of Works

The investigation works consisted of the following main elements:

- Twenty three cable percussion boreholes, eleven of which were further advanced using rotary coring techniques.
- Two drillholes advanced using rotary openhole/coring techniques
- Two windowless sample holes, advanced using a removable liner system.
- Fourteen mechanically excavated trial pits.
- One hand excavated inspection pit.
- Associated sampling.
- *In-situ* standard penetration, hand shear vane, variable head permeability, water quality parameter, photo-ionisation, soakaway and plate load testing.
- Installation of groundwater monitoring instrumentation.
- Post site works groundwater monitoring instrumentation.

Site work was carried out between the 1st and 26th February 2021 with subsequent post site work monitoring, laboratory testing and reporting thereafter. A factual report only was requested.

The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and on the results of tests carried out in the field and in the laboratory. There may, however, be special conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report.

2. THE SITE

2.1 Location

The approximate National Grid Reference of the site is between NZ 049 139 and NZ 082 136. This can be found on Ordnance Survey 1:50,000 Sheet Number 92 (Barnard Castle, Richmond & Teeside). Part of this sheet is reproduced as Figure 1, the Site Location Plan.

The site is located at Bowes approximately 6km southwest of Barnard Castle.

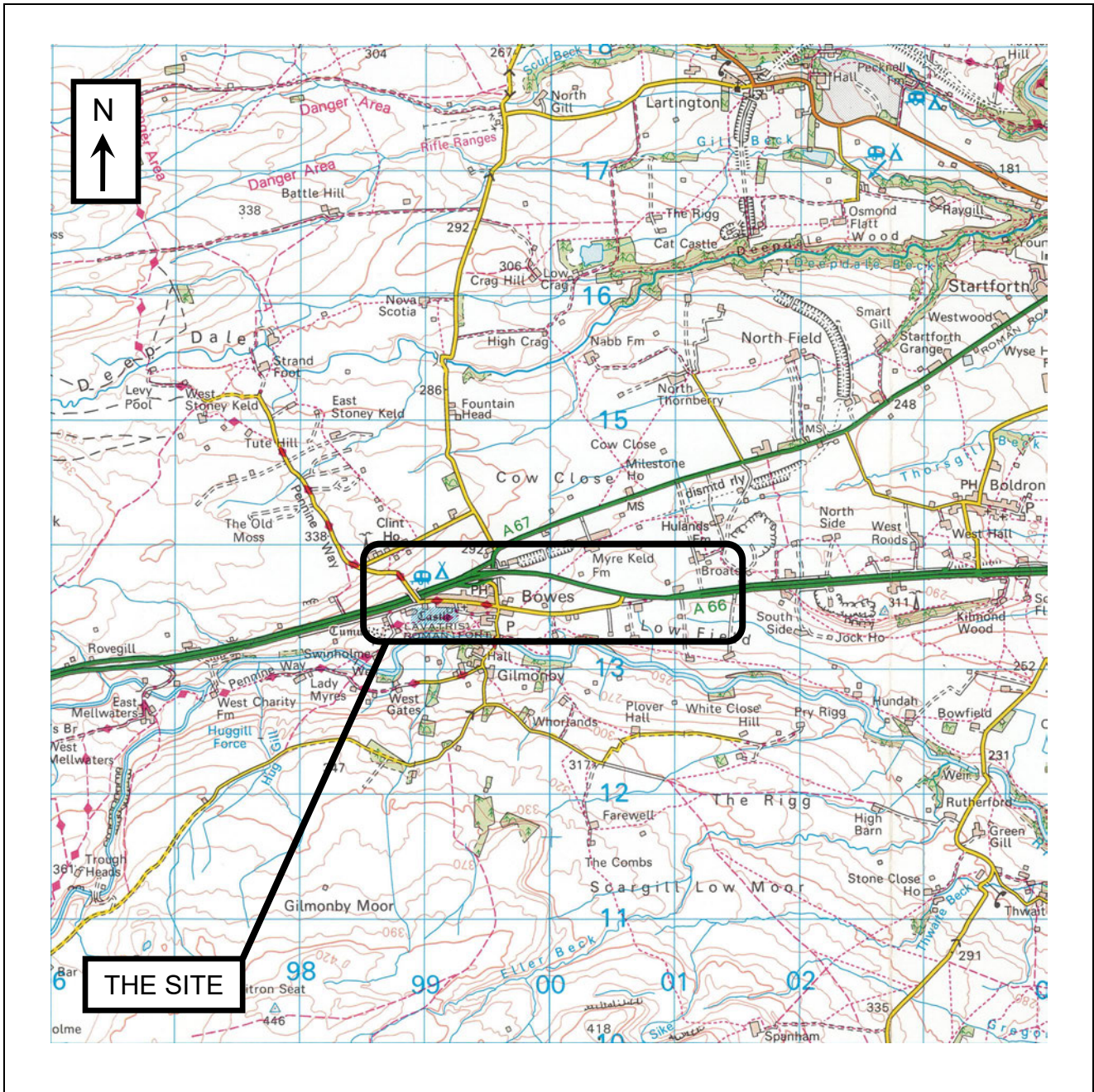


Figure 1: Site Location Plan

Reproduced from the Ordnance Survey 1:50,000 scale Landranger map by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, Crown Copyright. All rights reserved. Licence number AL 100002282.

2.2 Site Description and Topography

The site is located at Bowes near Barnard Castle the site follows a roughly linear route along the A66. The site comprises a number of farm fields to the north and south of the A66 with some farms and associated farm buildings. The River Greta runs past the south of the site.

3. SITE OPERATIONS

3.1 General

All exploratory hole work, associated sampling, *in-situ* testing and logging was carried out in accordance with techniques outlined in Table 1, as appropriate; at positions as near as practicable to those supplied by the Consulting Engineer. These are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

Reference Code Number	Title
BS 1377:1990	Methods of Test for Soils for Civil Engineering Purposes (where not in contravention or superseded by Eurocode references)
BS 5930:2015	Code of Practice for Ground Investigation (where not in contravention or superseded by Eurocode references)
BS EN ISO 14689-1:2003	Identification and Classification of Rock
BS EN ISO 14688-1:2002 & 14688-2:2004	Identification and Classification of Soil
BS 10175:2011+A2:2017	Investigation of Potentially Contaminated Sites
BS EN ISO 22476-3: 2005	Geotechnical investigation and testing - Field testing - Part 3 Standard Penetration Testing

Table 1: British Standard Reference Code Number

The depths of all exploratory holes, descriptions of the material encountered, details of any groundwater encountered, samples taken and *in-situ* testing carried out together with any other relevant information can be found on the Borehole, Window/Windowless Sample Hole, Trial Pit and Inspection Pit Records, Field Data Enclosures 2, 3, 4 and 5 respectively. A key to all symbols and abbreviations used throughout the report is included in the Key Sheets.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay). With respect to rotary coring, driller's records and observations of the recovered core are used to determine any zones of no recovery (core loss). These zones are based on the interpretation of the logging engineer and are therefore subjective. Refer to the Key Sheets for further information.

Some of the works were undertaken with coordinated traffic management installed by Premier Traffic Management Limited along the carriageway to facilitate the investigation operation.

3.2 Environmental Considerations: Ecology Watching Brief

All positions were observed and cleared by an ecologist from specialist subcontractor AES. None of the exploratory holes were moved from their original locations due to any ecological constraints.

3.3 Environmental Considerations: Archaeology Watching Brief

An archaeological watching brief was undertaken at the site during the works by specialist subcontractor Northern Archaeological Associates Ltd. An archaeologist was present during the excavation of all trial pits on the site. On completion of the works a report was provided of their findings. This report is presented as Appendix II.

3.4 Health & Safety Considerations: Services

Prior to excavation each position was cleared of services by specialist subcontractor Discovery Surveys Ltd. Before the commencement of any exploratory hole a search for underground services was conducted as prescribed in HSE publication ‘Avoiding Underground Services (HSG47)’ and in accordance with in-house internal safety procedure AEG-14.

Service plans were provided by the Client and were consulted prior to using a service locating device (such as a Cable Avoidance Tool or C.A.T.) to scan a working area around the proposed exploratory hole location. Where no services were indicated a ‘Permit-to-Work’ form was issued by the investigation supervisor and, with the exception of trial pits, the position was commenced with a hand excavated inspection pit. The inspection pit was also scanned during the excavation procedure. It should be noted that the digging of an inspection pit only confirms or guards against the possible presence of underground public utility services within the excavated pit. Where no services were indicated by the scanning procedure or inspection pit the exploratory hole was commenced in accordance with the Contract Specification.

Where services were located or there was reasonable belief that they were present, the position was relocated in agreement with the Client. Details of any services uncovered/located during this investigation are given in Table 2.

Exploratory Hole Number	Type of Service	Orientation & Depth (size where indicated)	Status (Damaged/Undamaged)	Additional Remarks
No services were encountered within the inspection pits dug for the purposes of the exploratory hole works. Services were known to exist within the vicinity of exploratory holes, The location and nature of these services are beyond the scope of this report.				

Table 2: Services Encountered

3.5 Exploratory Holes: Boreholes and Drillholes

Twenty three boreholes were sunk using either a Dando 2000 or a Dando 300 drilling rig, utilising cable percussive (shell and clay cutter) techniques, to depths of between 1.20m (BH BB010, BH BB011, BH BB012 & BH BB018) and 10.00m BGL (BH BB003). Twelve of these boreholes were further advanced using a Comacchio GEO 205 drilling rig, utilising rotary coring methods, to depths of between 5.00m (BH BB010) and 20.30m BGL (BH BB024).

Two drillholes were sunk using a Comacchio GEO 205 drilling rig, utilising rotary openhole/coring methods, to depths of 5.00m (BH BB002) and 15.00m BGL (BH BB003).



Rotary coring employed a 'P' (121mm OD) barrel in combination with a P.C.D. drill bit together with air/mist flushing medium. This coring assembly was used to recover 92mm lined cylindrical specimens of rock core.

The Borehole Records are presented as Field Data Enclosure 2 and a summary of any relevant remarks are detailed in Table 3.

Exploratory Hole Number	Drilling Method	Completion Depth (m BGL)	Installation	Remarks
BH BB002	RO	5.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB003	RO+RC	15.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB004	CP	5.50	Yes – refer to Section 3.11	Terminated due to obstruction.
BH BB005	CP	8.50	Yes – refer to Section 3.11	Advanced to required depth.
BH BB006	CP	6.10	Yes – refer to Section 3.11	Advanced to required depth.
BH BB007	CP+RC	19.70	Yes – refer to Section 3.11	Advanced to required depth.
BH BB008	CP+RC	15.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB009	CP+RC	10.50	Yes – refer to Section 3.11	Advanced to required depth.
BH BB010	CP+RC	5.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB011	CP+RC	15.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB012	CP+RC	20.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB013	CP	5.00	Yes – refer to Section 3.11	Terminated due to obstruction.
BH BB014	CP+RC	10.60	Yes – refer to Section 3.11	Advanced to required depth.
BH BB015	CP	5.10	Yes – refer to Section 3.11	Advanced to required depth.
BH BB016	CP	2.40	Yes – refer to Section 3.11	Terminated refusal/possible bedrock.
BH BB017	CP	2.00	No – reinstated	Terminated due to possible rockhead obstruction.
BH BB018	CP+RC	15.00	Yes – refer to Section 3.11	Advanced to required depth.
BH BB019	CP	3.00	No – reinstated	Terminated due to obstruction (possible rockhead).
BH BB020	CP+RC	15.00	No – reinstated	Advanced to required depth.
BH BB021	CP	5.50	No – reinstated	Advanced to required depth.
BH BB022	CP	3.00	Yes – refer to Section 3.11	Terminated due to an obstruction.
BH BB023	CP+RC	17.60	Yes – refer to Section 3.11	Advanced to required depth.
BH BB024	CP+RC	20.30	Yes – refer to Section 3.11	Advanced to required depth.
BH BB025	CP	2.50	Yes – refer to Section 3.11	Terminated due to an obstruction.
BH BB026	CP	3.00	No – reinstated	Terminated due to an obstruction.

Any relevant photographs are presented after the applicable Borehole Record

Table 3: Borehole Summary

3.6 Exploratory Holes: Window/Windowless Sample Holes

Two windowless sample holes were sunk using a Premier Compact 110 Series tracked rig utilising a removable liner system, to depths of 2.40m (WS BB001) and 5.20m BGL (WS BB002). The

Window/Windowless Sample Hole Records are presented as Field Data Enclosure 3 and a summary of any relevant remarks are detailed in Table 4.

Exploratory Hole Number	Drilling Method	Completion Depth (m BGL)	Installation	Remarks
WS BB001	WLS	2.40	No – reinstated	Terminated due to an obstruction.
WS BB002	WLS	5.20	No – reinstated	Terminated due to possible bedrock.

Any relevant photographs are presented after the applicable Window/Windowless Sample Hole Record

Table 4: Window/Windowless Sample Hole Summary

3.7 Exploratory Holes: Mechanically Excavated Trial Pits

Fourteen trial pits were mechanically excavated using a 14 Tonne 360 Tracked Excavator to depths of between 0.35m (TP BB003) and 4.50m BGL (TP BB002, TB BB004, TP BB005, TP BB006, TP BB007, TP BB011 & TP BB014). The Trial Pit Records are presented as Field Data Enclosure 4 and a summary of any relevant remarks are detailed in Table 5.

Exploratory Hole Number	Excavation Method	Completion Depth (m BGL)	Remarks
TP BB001	Machine Excavated	3.10	Terminated - repeated collapse of long faces.
TP BB002	Machine Excavated	4.50	Advanced to required depth.
TP BB003	Machine Excavated	0.35	Terminated due to possible bedrock. No room to move pit due to services, tarmac footpath and tree cover.
TP BB004	Machine Excavated	4.50	Advanced to required depth.
TP BB005	Machine Excavated	4.50	Advanced to required depth.
TP BB006	Machine Excavated	4.50	Advanced to required depth.
TP BB007	Machine Excavated	4.50	Advanced to required depth.
TP BB008	Machine Excavated	1.70	Terminated - repeated collapse of long faces.
TP BB009	Machine Excavated	2.70	Terminated - repeated collapse of long faces.
TP BB010	Machine Excavated	3.10	Terminated due to collapse.
TP BB011	Machine Excavated	4.50	Advanced to required depth.
TP BB012	Machine Excavated	2.40	Terminated due to large boulders (refusal).
TP BB013	Machine Excavated	2.90	Terminated due to large boulders (refusal).
TP BB014	Machine Excavated	4.50	Advanced to required depth.

Any relevant photographs are presented after the applicable Trial Pit Record

Table 5: Trial Pit Summary

3.8 Exploratory Holes: Hand Excavated Inspection Pits

One inspection pit was hand excavated to a depth of 0.50m BGL (HDP BB001). The Inspection Pit Records are presented as Field Data Enclosure 5 and a summary of any relevant remarks are detailed in Table 6.

Exploratory Hole Number	Excavation Method	Completion Depth (m BGL)	Remarks
HDP BB001	Hand Excavated	0.50	Terminated - possible bedrock.

Any relevant photographs are presented after the applicable Inspection Pit Record

Table 6: Inspection Pit Summary

3.9 Samples

Representative samples of soil and rock were obtained from the exploratory holes and were taken to the laboratory for selected geotechnical and specialist chemical testing.

Environmental samples were taken in accordance with the contract specification during the investigation using an approved selection of container types in order to suit the encountered material properties and designated laboratory analytical parameters. Full chain of custody procedures were in place post sampling and during the transportation stage to the nominated specialist chemical laboratory. Environmental samples were administered appropriately following the best practice guidance provided in the contract specification.

3.10 Groundwater

The comments on groundwater conditions are based on the observations made at the time of investigation. It should be noted that groundwater levels may vary due to seasonal and other effects. Furthermore, water was added during advancement of a number of the boreholes in order to facilitate drilling operations. As a consequence there is a possibility that this could have masked the discrete ingress of natural groundwater into the boreholes, which subsequently may have been sealed as a result of progressing the casing.

Groundwater was encountered in a number of the boreholes and trial pits during the site works operation. Where groundwater observations were made details are given on the relevant Borehole and Trial Pit Record and in greater detail (collectively in tabulated format) as Field Data Enclosure 6: Groundwater Observations Made at the Time of Site Works. Standing water levels were recorded in the majority of boreholes at the beginning and/or end of each drilling shift. The water level is indicated on the applicable Borehole Record as part of the boring progress information.

3.11 Instrumentation & Monitoring

Twenty boreholes were installed with monitoring instrumentation in accordance with the requirements of the Consulting Engineer. Details of the installations are shown in Table 7 and on the relevant Borehole Records.

Exploratory Hole Number	Instrumentation	Installation Depth (m BGL)	Response Zone (m BGL)
BH BB002	1 No. 19mm diameter standpipe piezometer	4.30	3.50-4.50
BH BB003	1 No. 19mm diameter standpipe piezometer	11.00	10.00-12.00
BH BB004	1 No. 19mm diameter standpipe piezometer	4.50	1.00-5.00
BH BB005	1 No. 19mm diameter standpipe piezometer	5.00	4.50-5.50
BH BB006	1 No. 19mm diameter standpipe piezometer	5.00	4.50-5.50
BH BB007	1 No. 50mm diameter slotted standpipe	12.00	10.00-12.00
BH BB008	1 No. 19mm diameter standpipe piezometer	2.50	2.00-3.00
BH BB009	1 No. 19mm diameter standpipe piezometer	6.50	6.00-7.00
BH BB010	1 No. 19mm diameter standpipe piezometer	2.00	1.00-3.00

BH BB011	1 No. 19mm diameter standpipe piezometer	4.00	3.50-4.50
BH BB012	1 No. 19mm diameter standpipe piezometer	8.00	7.00-9.00
BH BB013	1 No. 50mm diameter slotted standpipe	4.00	1.50-4.00
BH BB014	1 No. 19mm diameter standpipe piezometer	3.00	1.50-3.50
BH BB015	1 No. 19mm diameter standpipe piezometer	2.00	1.00-3.00
BH BB016	1 No. 19mm diameter standpipe piezometer	2.00	1.50-2.40
BH BB018	1 No. 19mm diameter standpipe piezometer	4.50	3.50-5.00
BH BB022	1 No. 19mm diameter standpipe piezometer	3.00	1.50-3.00
BH BB023	1 No. 19mm diameter standpipe piezometer	6.00	5.00-7.00
BH BB024	1 No. 19mm diameter standpipe piezometer	2.00	1.00-3.00
BH BB025	1 No. 19mm diameter standpipe piezometer	2.00	1.50-2.30

Table 7: Instrumentation Summary

Instruments were monitored for groundwater on five occasions at weekly intervals after the completion of the site works in accordance with the Contract Specification. A record of the readings is presented as Field Data Enclosure 7 (Groundwater Monitoring Results).

Groundwater sampling was undertaken from selected installations during the first round of post site works monitoring. Water Quality Parameters were recorded for the purged water prior to sampling (see Section 4.5). Surface water samples were also taken during the first monitoring round at locations provided by the Consulting Engineer.

3.12 Operative Observations: Potential Contamination

For the purposes of determining the condition of the site, with regard to human health and environmental issues, reference should specifically be made to any specialist chemical testing undertaken as part of the investigation scheme, as well as any supporting desk study and risk assessment documentation. The information given herein collates the observations made by the operatives involved in the investigation only and comments that have been indicated on the engineering records.

Where there was potential evidence of contamination, principally as a consequence of olfactory and visual identification, information is provided in Table 8.

Exploratory Hole Number	Occurrence (in-situ/surface/laboratory sample)	Visual / Olfactory / Laboratory Testing	Depth (m BGL)	Occurrence Type	Additional Remarks
No occurrences recorded during the investigation.					

Table 8: Potential Contamination Encountered

It should be stressed that the information provided herein is subjective, as it is based on the perceptions of individuals and not specialists routinely involved in the chemical determination of contaminated residues, liquors, vapours or solid contaminants.

3.13 Surveying

The investigation positions were surveyed after completion of site works using a Leica Smartrover (Model ATX 1230+ GNSS) GPS based instrument which provides corrected Ordnance Survey co-ordinates in real time to an accuracy of within $\pm 30\text{mm}$ vertical and $\pm 30\text{mm}$ horizontal. These positions have been subsequently plotted in AutoCAD® software and are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

4. IN-SITU TESTING

4.1 General

In-situ testing as specified by the Consulting Engineer was carried out in selected boreholes, windowless sample holes and trial pits in accordance with techniques outlined in the relevant British Standard and/or AEG Quality Procedure. The results are presented in the *In-situ* Testing Enclosures with a number of the test results summarised at the relevant depth on the Borehole, Drillhole, Window/Windowless Sample Hole and Trial Pit Records.

4.2 Standard Penetration Test Results

Standard Penetration Testing (SPT) was carried out in the boreholes, drillholes and windowless sample holes in accordance with techniques outlined in BS EN ISO 22476-3: 2005 in order to determine the relative density and consistency of the strata encountered. The 'N' value (number of blows per 300mm penetration) or the penetration per blow was recorded for each test. Uncorrected 'N' values or penetration per blow data are provided on the applicable Borehole, Drillhole and Window/Windowless Sample Hole Records. (Refer to page 6 of the key sheets for further details).

More detailed information concerning the standard penetration testing is given in *In-situ* Testing Enclosure 1 which includes the following;

- Initial exploratory hole conditions prior to the test procedure.
- Calibration and energy ratio (E_m) information for the SPT hammer device used to carry out the test.
- A breakdown of blows for each 75mm penetration interval.
- Rod length (C_R) and energy (C_E) correction ratios.
- Uncorrected 'N' value.
- Corrected 'N₆₀' value that applies the rod (C_R) and energy (C_E) corrections indicated.
- Pertinent remarks corresponding to the test procedure.

In addition to the above, a graph has been prepared for each exploratory hole which plots the uncorrected and corrected 'N' value results against depth. Calibration certificates for the SPT apparatus used during the testing procedure are also presented for reference within this *In-situ* Testing Enclosure.

4.3 Hand Shear Vane

Hand shear vane testing using calibrated Edeco Pilcon Hand Vane equipment was carried out in the boreholes and trial pits in accordance to the ground conditions encountered. The results are presented in detail within *In-situ* Testing Enclosure 2 with the average peak and residual shear strength values provided on the applicable Trial Pit Record.

4.4 Variable Head Permeability Testing

Variable head (rising/falling) permeability tests were carried out in nine selected standpipe installations in accordance with the requirements of the Consulting Engineer utilising the methods described in BS5930: Section 4:1999. The data is presented in *In-Situ* Testing Enclosure 3.

4.5 *In-situ* Water Quality Parameter Testing

Groundwater sampling was undertaken from selected installations during the first round of post site works monitoring in accordance with techniques outlined in the relevant British Standard and/or AEG Quality Procedure. Water Quality Parameters were recorded for the purged water prior to sampling. The parameters tested were pH, temperature, electrical conductivity, redox potential and dissolved oxygen. The results are presented in tabular format as *In-situ* Testing Enclosure 4.

4.6 Photo Ionisation Detector (PID)

Photo-ionisation detector (PID) screening for semi-volatile and volatile organic compounds was conducted on selected environmental samples taken during the investigation using a MiniRAE 2000. The results for the PID tests are recorded in tabular format as *In-situ* Testing Enclosure 5 and, where applicable, on the Borehole Records.

4.7 Soil Infiltration Determination (Soakaway Design)

Five Soakaway tests were carried out in selected trial pits utilising the methods described in BRE Digest 365:1991, in accordance to the requirements of the Consulting Engineer. The results are presented in *In-Situ* Testing Enclosure 6 with reference to the individual test carried out in the general remarks section of the relevant Trial Pit Record.

4.8 Plate Load Testing

Plate load and zone pad load testing was carried out at nominated locations within the investigated area. Results from this work are presented in *In-situ* Testing Enclosure 7.

5. LABORATORY TESTING

5.1 General

Laboratory testing as scheduled by the Consulting Engineer was carried out on selected samples in accordance with techniques outlined in BS 1377:1990, AEG Laboratory Quality Procedures or other appropriate standard as quoted.

5.2 Geotechnical Testing

The results are presented in the Laboratory Enclosures with an outline list of the procedures undertaken given in Table 9.

Test	Procedure
Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Plasticity Index and Moisture Content	BS 1377 Part 2 1990 (BS EN ISO 17892-1:2014)
Determination of Density by Linear Measurement	BS 1377 Part 2 1990 (BS EN ISO 17892-2:2014)
Determination of Particle Density	BS 1377 Part 2 1990
Particle Size Distribution Sieving	BS 1377 Part 2 1990
Particle Size Distribution Sedimentation	BS 1377 Part 2 1990
Determination of Chloride, Total Sulphur, Sulphate and pH (Tested externally)	See External Laboratory Certificates
Determination of Dry Density/Moisture Content Relationship	BS 1377 Part 4 1990
Determination of Moisture Condition Value	BS 1377 Part 4 1990
Determination of MCV / Moisture Relationship	BS 1377 Part 4 1990
Determination of California Bearing Ratio	BS 1377 Part 4 1990
Determination of One Dimensional Consolidation Properties	BS 1377 Part 5 1990
Shear Strength by Hand Vane	BS 1377 Part 7 1990
Shear Strength by Direct Shear	BS 1377 Part 7 1990
Undrained Shear Strength in Triaxial Cell without Pore Water Pressure Measurement	BS 1377 Part 7 1990
Consolidated Undrained Shear Strength in Triaxial Cell with Measurement of Pore Pressure	BS 1377 Part 8 1990
Moisture Content of Rock	ISRM 1981
Determination of Point Load Index	ISRM 1985
Determination of Unconfined Compressive Strength (Tested externally)	See External Laboratory Certificates

Table 9: Geotechnical Testing

5.3 Specialist Chemical Testing

Selected samples have been submitted for chemical analysis as specified by the Consulting Engineer, conducted under a subcontract arrangement with Derwentside Environmental Testing Services (DETS). The results of this testing are presented as Appendix I.

5.4 Laboratory Identified Asbestos

Selected samples were analysed for asbestos content as specified by the Consulting Engineer. Any identified asbestos is presented in Table 10 which has been summarised from specialist chemical testing results (see Appendix I for further details).

Exploratory Hole Number	Occurrence	Depth (m BGL)	Occurrence Type	Additional Remarks
No asbestos was detected within the samples selected for testing by the Consulting Engineer				

Table 10: Laboratory Identified Asbestos

Key Sheets





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Key Sheets



INTRODUCTION

The following explanatory notes define the terminologies, abbreviations and symbols pertaining to each individual column or section of the Exploratory Hole records. 'Exploratory Hole' is used as a general term in this report to comprise borehole, drillhole, and trial pit. All exploratory hole records have been produced using 'gINT®', which is an integrated software environment for the storage and manipulation of subsurface data.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature, and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay). With respect to rotary coring, driller's records and observations of the recovered core are used to determine any zones of no recovery (core loss). These zones are based on the interpretation of the logging engineer and are therefore potentially subjective. In addition, where relevant, every effort is made to highlight material/zones that may relate to suspected old workings. However, it should be noted that this is not straightforward (especially without detailed information regarding anticipated subsurface conditions) and therefore no guarantee can be made with regards to the accuracy of the interpretation of the recovered core.

INFORMATION COMMON TO ALL EXPLORATORY HOLE RECORDS

Status Box

The status box in the top right hand corner of each exploratory hole record gives the status of each individual record i.e. PRELIM1, PRELIM2, PRELIM3 FINAL etc. The date shown relates to the last instance the data was revised. This information is for AEG Quality Assurance only.

Exploratory Hole No

The identity number used throughout the report.

Project

The ground investigation project name. Occasionally the project name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Client

Client's name responsible for funding the ground investigation project. The Client's name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Location

The exploratory hole position given as either national grid co-ordinates, local grid if specified, or a reference name normally pertaining to the area of investigation.

Method (Equipment)

Represents the drilling, excavation or boring method(s) or equipment used.

Ground Level (m(AOD))

The precise ground level in metres above Ordnance Datum at the exploratory hole location from which the reduced level for each stratigraphic boundary is calculated.

Date

The date relating to the start of the exploratory hole excavation.

Sheet

The sheet number and total number of sheets for the particular record.

Checked By

Printed signature of the person who has carried out the technical quality check on the log.

Logged By

The name of the engineer who has carried out the logging of the exploratory hole.

Contract No.

The Allied Exploration & Geotechnics Limited reference number for the project.



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Key Sheets






INFORMATION RELEVANT TO BOREHOLE AND WINDOW/WINDOWLESS SAMPLE HOLE RECORDS

Sample & Tests Columns

Depth	The depth over which a sample or test is taken is shown in depth column of the exploratory hole record in a "from...to" format.
Type No	Indicates the type of sample/test and number given by the driller.
Test Result	Result of the test given in the applicable units.

Water Column

Water Strike	Level of groundwater strike within an exploratory hole. The symbol  denotes a water strike and is suffixed with a number, which indicates the strike order. The corresponding unfilled symbol  is the depth the strike rose to.
Seepage	Groundwater seepage within an exploratory hole is denoted by the  symbol.

Strata Columns

Reduced Level	The corresponding reduced level of each soil or rock boundary in metres Ordnance Datum.
Legend	A graphical representation of the materials encountered using BS 5930 recommended symbols for soil and rock.
Depth (Thickness)	The depth below ground level of each soil or rock boundary in metres and the thickness of each individual stratigraphic unit (given in brackets).
Description	<p>Engineering description of each individual soil or rock type follows recommendations outlined in the current BS 5930 with the following implementation:</p> <ol style="list-style-type: none"> The amendment of section 6 incorporates the guidance indicated in BS EN ISO 14688-1, BS EN ISO 14688-2 and BS EN ISO 14689-1 European Standard with particular emphasis on current UK practice. Supplementary laboratory or in-situ assessed measurements of undrained strength are provided where applicable information is available in parenthesis in accordance with BS 5930 after the field strength determined consistency. The description based measurement table indicating the quantitative undrained strength classification divisions is provided in Key Sheets Table 1.

Term based on measurement	Undrained strength classification definition cu, in kPa (from BS EN ISO 14688-2, 5.3, Table 6)
Extremely low	<10
Very low	10-20
Low	20-40
Medium	40-75
High	75-150
Very High	150-300
Extremely High	300-600

KEY SHEETS TABLE 1

- Cobble and boulder content is expressed in accordance with the terms provided in BS5930 where visually identified in trial pit excavations, or inferred/recovered during the drilling operations. The assessment of frequency and spatial occurrence of coarse and very coarse rock material should not be considered as precise, but only an indicator or estimate of the potential conditions. It should be noted that the recovery of coarse or very coarse particles in boreholes is dependent on the limitations imposed by the casing diameter. The terminology used is outlined in Key Sheets Table 2.



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Key Sheets



Fraction	Percent by Mass	Term
Boulders	<5	Low boulder content
	5 to 20	Medium boulder content
	>20	High boulder content
Cobbles	<10	Low cobble content
	10 to 20	Medium cobble content
	>20	High cobble content

KEY SHEETS TABLE 2

- 4 Rock Strength based on assessed field or measured unconfined compressive strength follows the classification scheme given in BS5930 as outlined in Key Sheets Table 3.

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurement (MPa)	Superseded Classification of Rock Strength: Terminology (Strength Range MPa)	Definition for field use
Extremely weak	Scratched by thumbnail, gravel size lumps can be crushed between finger and thumb.	0.6-1.0	Extremely weak (0.6-1.0)	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.
Very weak	Scratched by thumbnail, lumps can be broken by heavy hand pressure, can be peeled easily by a pocket knife, crumbles under firm blows with point of geological hammer.	1-5	Very weak (1-5)	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.
Weak	Thin slabs, corners or edges can be broken off with hand pressure, can be peeled by a pocket knife, shallow indentations made by firm blow with point of geological hammer.	5-12.5	Weak (5-25)	Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.
Moderately Weak	Thin slabs, corners or edges can be broken off with hand pressure, can be scratched with difficulty by pocket knife, hand-held specimen can be broken with single firm blow of geological hammer.	12.5-25		
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen on a solid surface can be fractured with single firm blow of geological hammer.	25-50	Medium Strong (25-50)	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.
Strong	Specimen requires more than one blow of geological hammer to fracture it.	50-100	Strong (50-100)	Requires more than one blow of geological hammer to fracture.
Very Strong	Specimen requires many blows of geological hammer to fracture it.	100-250	Very Strong (100-250)	Requires many blows of geological hammer to fracture.
Extremely strong	Specimen can only be chipped with geological hammer.	>250	Extremely strong (<250)	Can only be chipped with geological hammer.
Based on BS EN ISO 14689-1 4.2.7, Table 2			Based on BS EN ISO 14689-1:2003 4.2.7, Table 5 (Superseded Version)	

KEY SHEETS TABLE 3

- 5 Where 'rock weathering classification' can be applied it is 'Approach 4' which will be used. If any other approach is used the factual text of the report will provide details of the applicable specific approach. (Ref.: BS5930). An outline of the 'Approach 4' rock weathering classification scheme is provided as Key Sheets Table 4.

APPROACH 4 CLASSIFICATION INCORPORATING MATERIAL AND MASS FEATURES		
Class	Classifier	Typical characteristics
A	Unweathered	Original strength, colour, fracture spacing
B	Partially weathered	Slightly reduced strength, slightly closer fracture spacing, weathering penetrating in from fractures, brown oxidation
C	Distinctly weathered	Further weathered, much closer fracture spacing grey reduction
D	Destructured	Greatly weakened, mottled, ordered lithorelics in matrix becoming weakened and disordered, bedding disturbed.
E	Residual or reworked	Matrix with occasional altered random or 'apparent' lithorelics, bedding destroyed. Classed as reworked when foreign inclusions are present as a result of transportation.

KEY SHEETS TABLE 4



Allied Exploration and Geotechnics Limited

Key Sheets



Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Boring Progress and Water Observations Columns

This section provides information on each day's production as a daily log.

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Casing Dia	Casing's diameter at the start of the shift.
Water Depth	Water level within the borehole at the start and end of shift.

Chiselling Columns

Indicates where hard strata occurred in the borehole and breaking out was carried out to advance the borehole.

From	The depth commenced.
To	The depth finished.
Hours	The time spent for breaking out.

Water Added Columns

Indicates the depth range where water was added to the borehole to facilitate boring or to prevent stress relief disturbance "blowing/boiling" in granular soils.

From	Depth in metres from where water was added.
To	Depth in metres to where water was added.

General Remarks

Any remarks believed to be relevant to the exploratory hole.

INFORMATION RELEVANT TO PIT/TRENCH RECORDS

The pit/trench records follow the same format as the borehole and window/windowless sample hole records for the Samples & Tests, Water and Strata columns. However, in addition to these there are the following:

Plan

A schematic plan view of the pit showing its excavated dimensions together with its orientation, given as a compass bearing to magnetic north.

Groundwater

Notes on water bearing horizons.

Stability

The engineer's comments outlining the stability of the sides during pit excavation.

General Remarks

The engineer's comments of any other information relevant to construction of the pit.

Additional Information

An indication if a sketch and/or photographs accompany the record.



Allied Exploration and Geotechnics Limited

Key Sheets



Underground Services

Depth	Depth service was encountered.
Orientation	Orientation given as a compass bearing to magnetic north.
Type	Type of service encountered.
Diameter	Diameter of service encountered.
Condition	Condition the service encountered was noticed in.

INFORMATION RELEVANT TO DRILLHOLE RECORDS AND ROTARY CONTINUATION

Run Details Columns

Depth	Each drill run is highlighted by a horizontal line with the top and bottom depths shown in metres. Core diameter (C Dia) is presented also within each run.
TCR (SCR) RQD	Information provided on the total core recovery, solid core recovery and rock quality designation. Refer to Abbreviations for further details.
Fracture Index	Information given relating to the fracture index of the rock.

Strata Columns

As the strata columns for borehole and window/windowless sample hole records except for description which is as follows:

Discontinuities Detail	Information on core discontinuities, localised variations in weathering, lithology, strength and structure follows recommendations outlined in BS5930.
Main	Engineering description of each individual soil or rock type follows recommendations outlined in BS5930.

Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Drilling Progress and Water Observations Columns

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Water Strike	Depth at which water was encountered.
Water Standing	Depth at which water in the hole levelled off.
Water Remarks	Any remarks believed to be relevant to the water e.g. Artesian.

Standard Penetration Test

Depth	The depth commenced.
Type	Type of standard penetration test (SPT).
Result	Result of SPT.

Flush

From	The depth commenced.
To	The depth finished.
Type	Details of the type of flush used. A = Air, F = Foam, W = Water and Pol = Polymer.
Returns	An indication of the percentage of the returned flush material.

General Remarks

Any remarks believed to be relevant to the exploratory hole.



Allied Exploration and Geotechnics Limited

Key Sheets



SAMPLES

B	Bulk disturbed sample.
ES	Environmental soil sample.
EW	Environmental water sample.
G	Gas sample.
J	Small disturbed sample.
LB	Large bulk disturbed sample.
P	Piston sample.
P*	An attempted but failed undisturbed piston sample.
U	Undisturbed sample.
U*	An attempted but failed general purpose undisturbed sample.
U _(ss)	Sample has been subsampled.
ES _(U)	Brackets following a sample denotes a subsample. The sample information within the brackets is the origin of the subsample.
W	Water sample.

IN-SITU TESTS

CBR	California Bearing Ratio mould sample or test.
HSV	In-situ hand shear vane.
HSV*	An attempted but failed in-situ hand shear vane.
HSV result of e.g. 80(20)kPa	Denotes average HSV peak result followed by average HSV residual result (in brackets).
HP	Hand penetrometer test.
K (F)	Falling head permeability test.
K (R)	Rising head permeability test.
K (C)	Constant head permeability test.
K (P)	Packer permeability test.
PT	Pressuremeter test.
PID	Photo ionisation detector test.
FID	Flame ionisation detector test.
S	Standard Penetration Test (SPT) using the split barrel sampler (shoe). The corresponding uncorrected 'N' value is given in the test result column with more detailed information provided in the In-Situ Testing Enclosures where applicable. Testing has been conducted in accordance with BS EN ISO 22476-3.
C	Denotes SPT test using a solid cone in preference to the split barrel sampler (usually in coarse granular soil) with all other reporting requirements as outlined above for the split barrel sampler.
S/C result of e.g. 1/2.94	Denotes where full penetration has not been achieved during the SPT test. In such cases the penetration (mm) per blow is recorded in the test result column e.g. 1/2.94 is 2.94mm of penetration per single blow.
SV	In-situ down-the-hole shear vane test. The remoulded shear strength is given in brackets.

ROCK QUALITY AND CORE RECOVERY

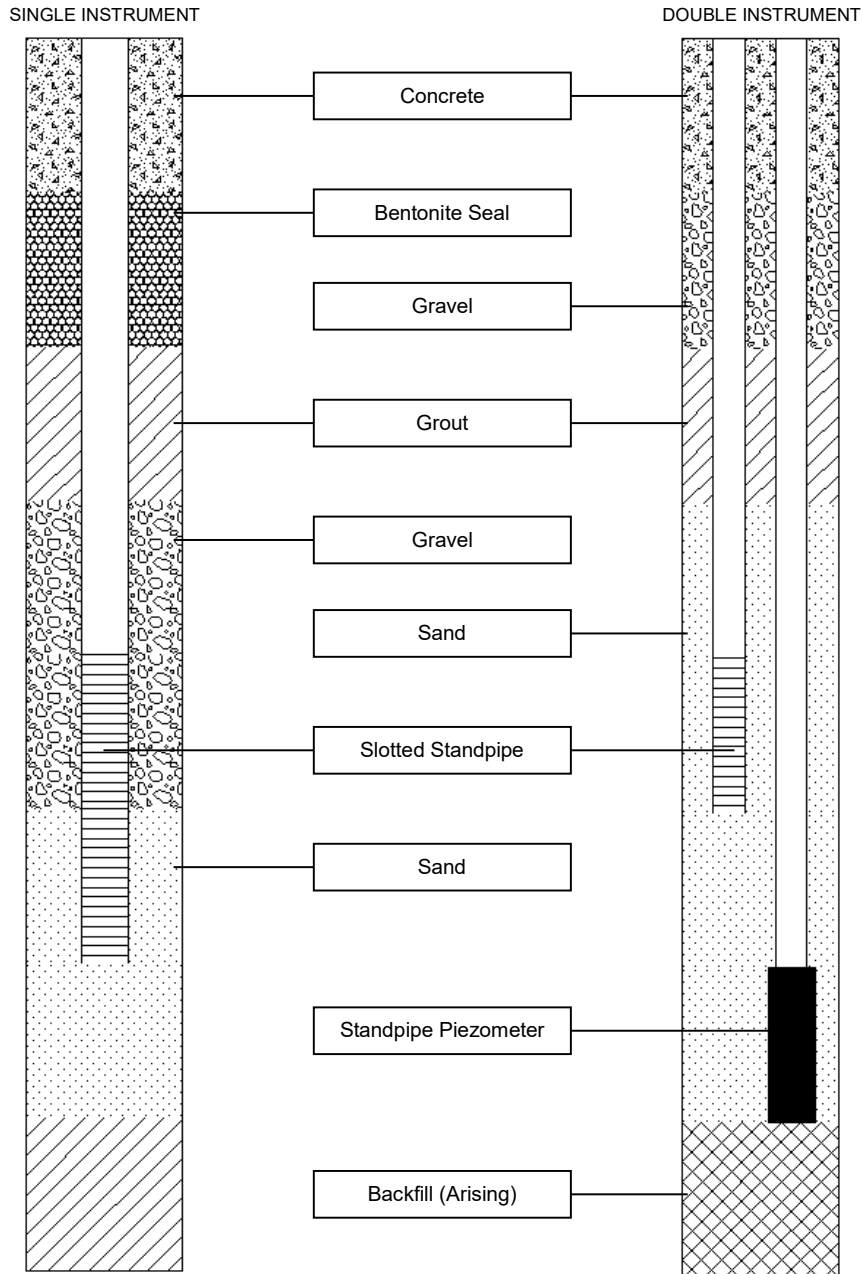
TCR	Total Core Recovery - the length of the recovered core expressed as a percentage of the length of core run.
SCR	Solid Core Recovery - the sum length of all core pieces that are recovered with at least one full diameter, expressed as a percentage of the length of core run.
RQD	Rock Quality Designation - The sum length of all core pieces that are 100mm or longer (measured along the centre of the core), expressed as a percentage of the length of core run.
FI	Fracture Index - The number of fractures per 1000mm length of solid core.
NI	Non-intact - The material recovered in a non-intact state.
NR	No recovery from the core run. These zones are based on the interpretation of the logging engineer and are therefore potentially subjective.



Allied Exploration and Geotechnics Limited Key Sheets



Symbols and Abbreviations: Explanation of Instrumentation Legends Used





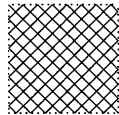
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Key Sheets

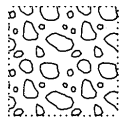


Symbols and Abbreviations: Explanation of Legends Used

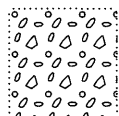
Soils	Rocks		
	<i>Sedimentary</i>	<i>Metamorphic</i>	<i>Igneous</i>



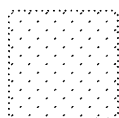
Made Ground



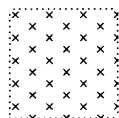
Cobbles and Boulders



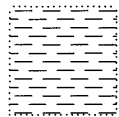
Gravel



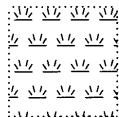
Sand



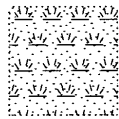
Silt



Clay

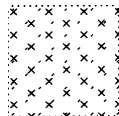


Peat

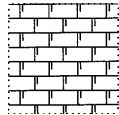


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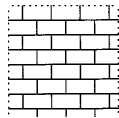
Note: Composite soil types will be signified by combined symbols e.g.



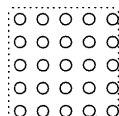
Silty Sand



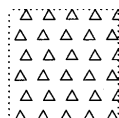
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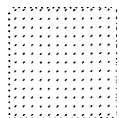
Limestone



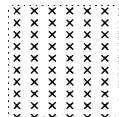
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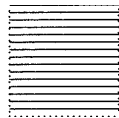
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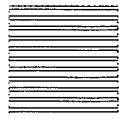
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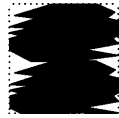
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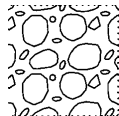
Mudstone



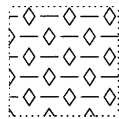
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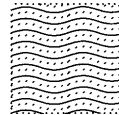
Coal



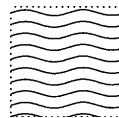
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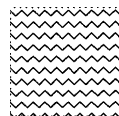
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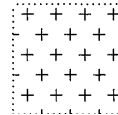
Coarse Grained



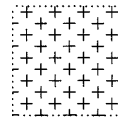
Medium Grained



Fine Grained



Coarse Grained



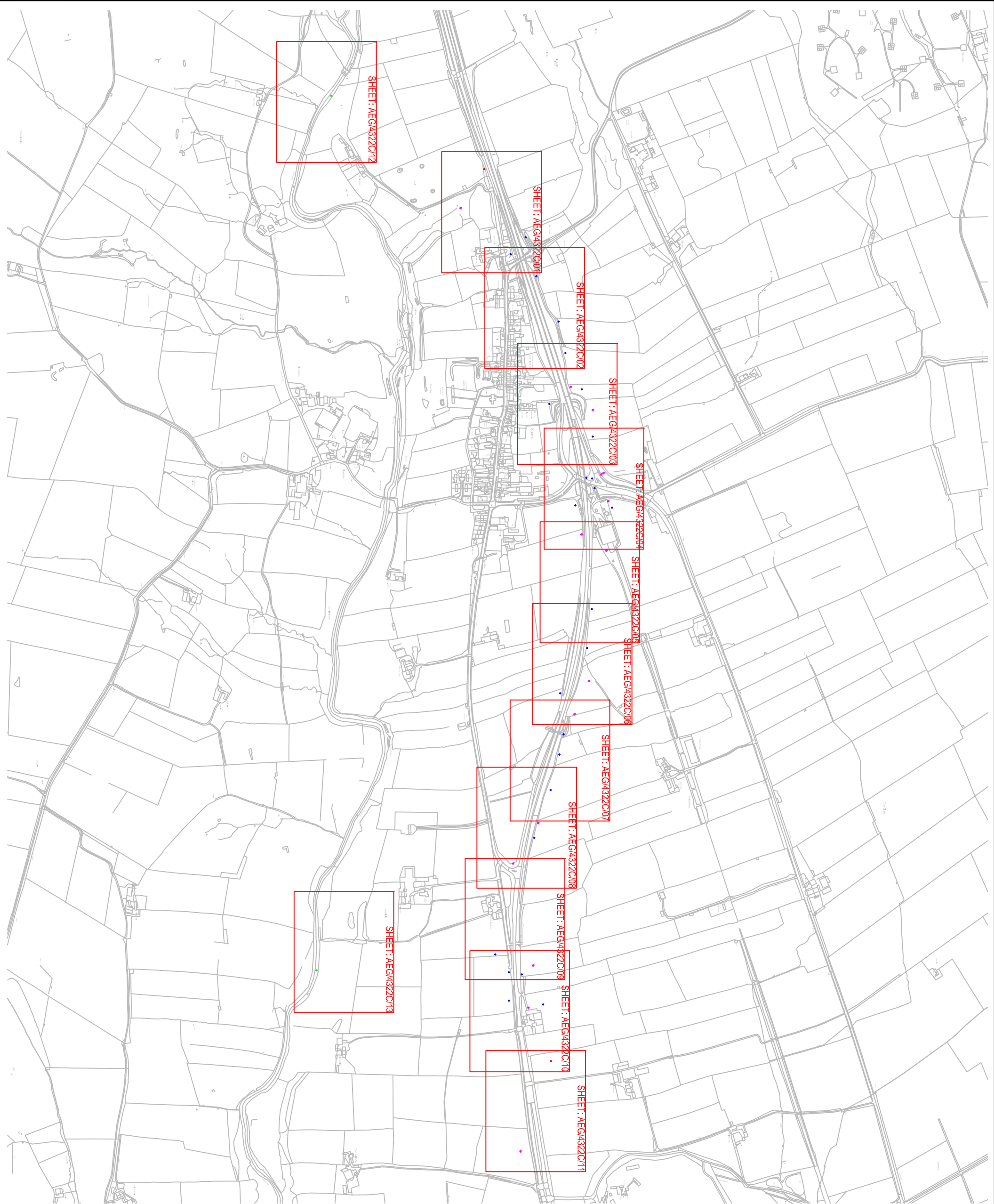
Medium Grained



Fine Grained





Exploratory Hole Location Plan





AEQ

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 (Fax): 0191 387 4710
 (Email: enquiries@aeq.uk.net)

- KEY:
-  BOREHOLE
 -  WINDOW/WINDOWLESS SAMPLE HOLE
 -  TRIAL/INSPECTION PIT
 -  SURFACE WATER SAMPLE

Base Plan Supplied by Consulting Engineer

Drawing Title:
ENC 01 : Exploratory Hole Location Plan

Drawing No.:
AEG4322C/OVERVIEW

Contract Title:
A66 North Trans Pennine Scheme D Section 7

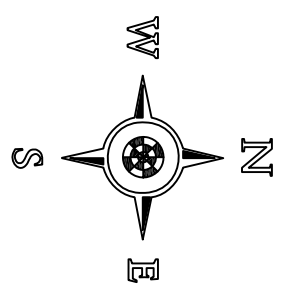
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AMEY OW Limited
Charcoery Exchange, 10 Furnival Street,
London, EC4A 1AB

Consultant:
Arup
Central Square, Forth Street,
Newcastle upon Tyne, NE1 3PL

Contract No.:
4322C

Scale:
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
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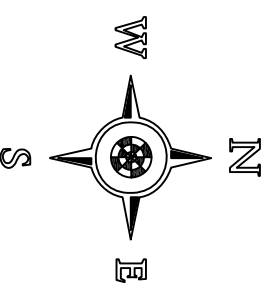




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 (Email): enquiries@aeq.uk.net

KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:
ENC 01 : Exploratory Hole Location Plan

Drawing No.:
AEG4322C/01

Contract Title:
A66 North Trans Pennine Scheme D Section 7

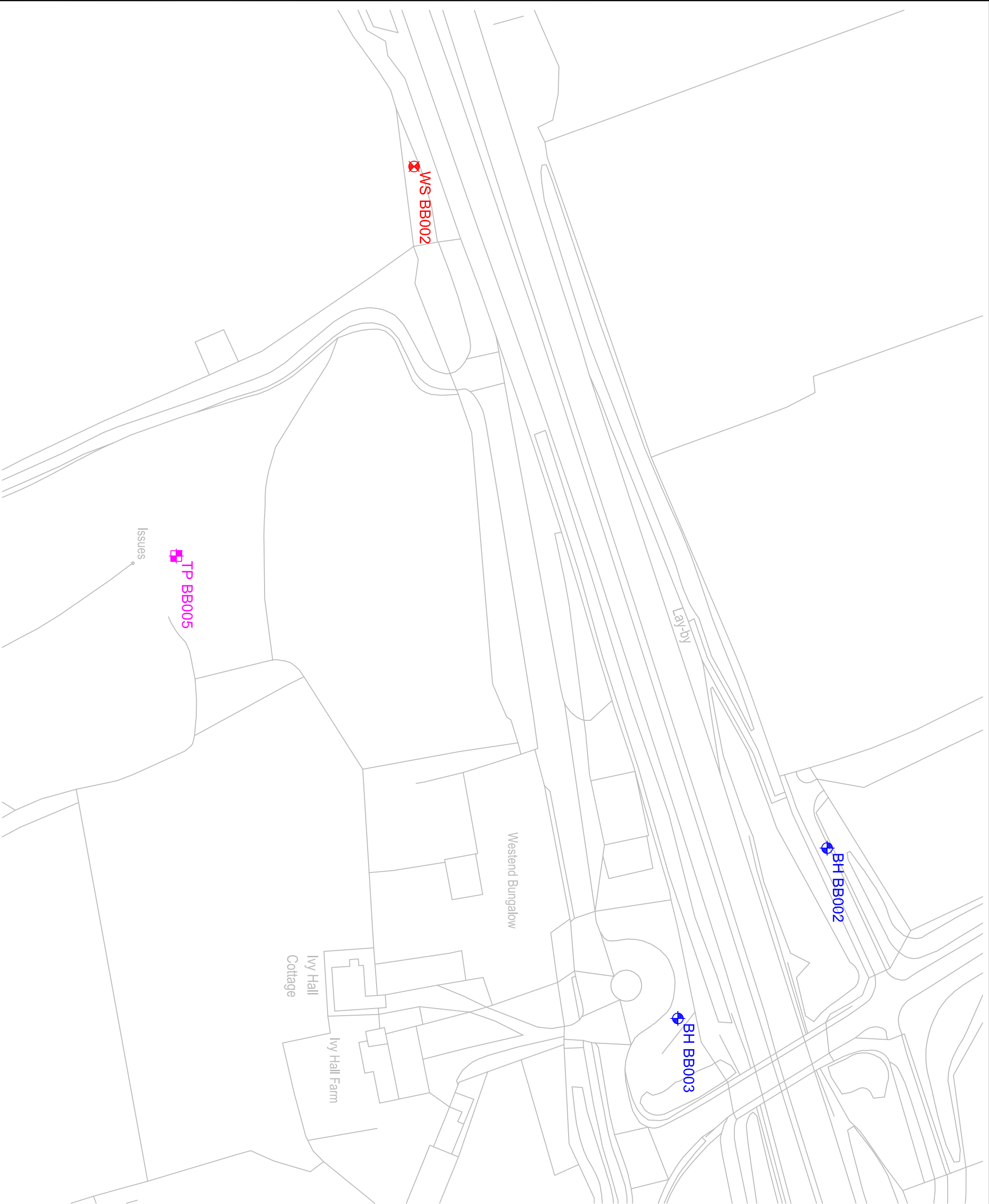
Client:
AMEY OW Limited
Charcoery Exchange, 10 Funnival Street,
London, EC4A 1AB

Consultant:
Arup
Central Square, Forth Street,
Newcastle upon Tyne, NE1 3PL

Contract No.:
4322C

Scale:
1:1000 @ A3





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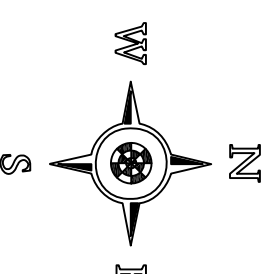




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG/4322C/02

Contract Title:

A66 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

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Contract No.:

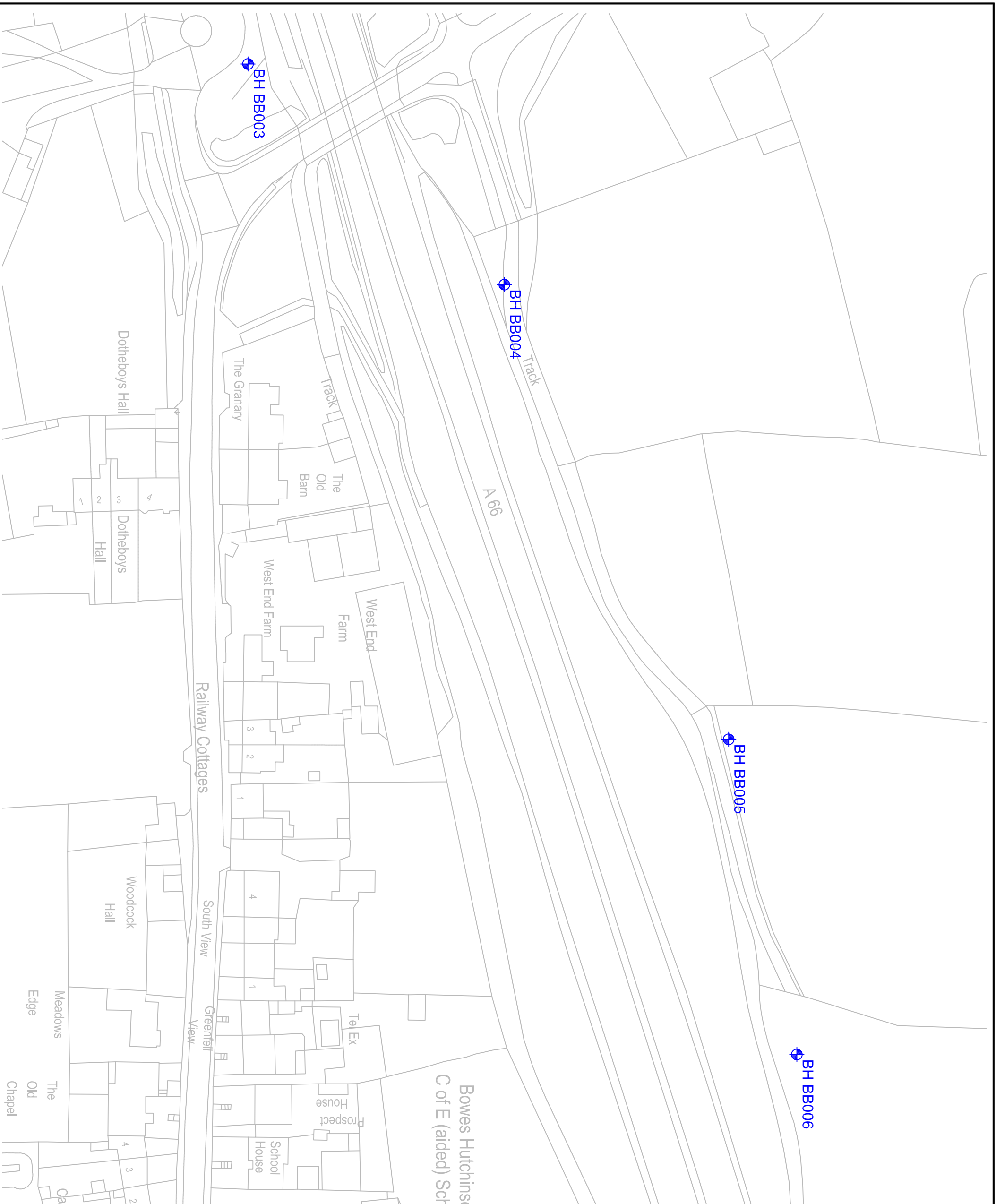
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
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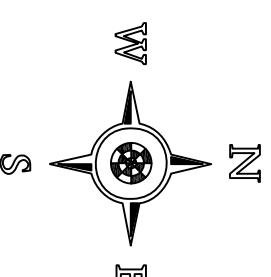




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/03

Contract Title:

A66 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Furlival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
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Contract No.:

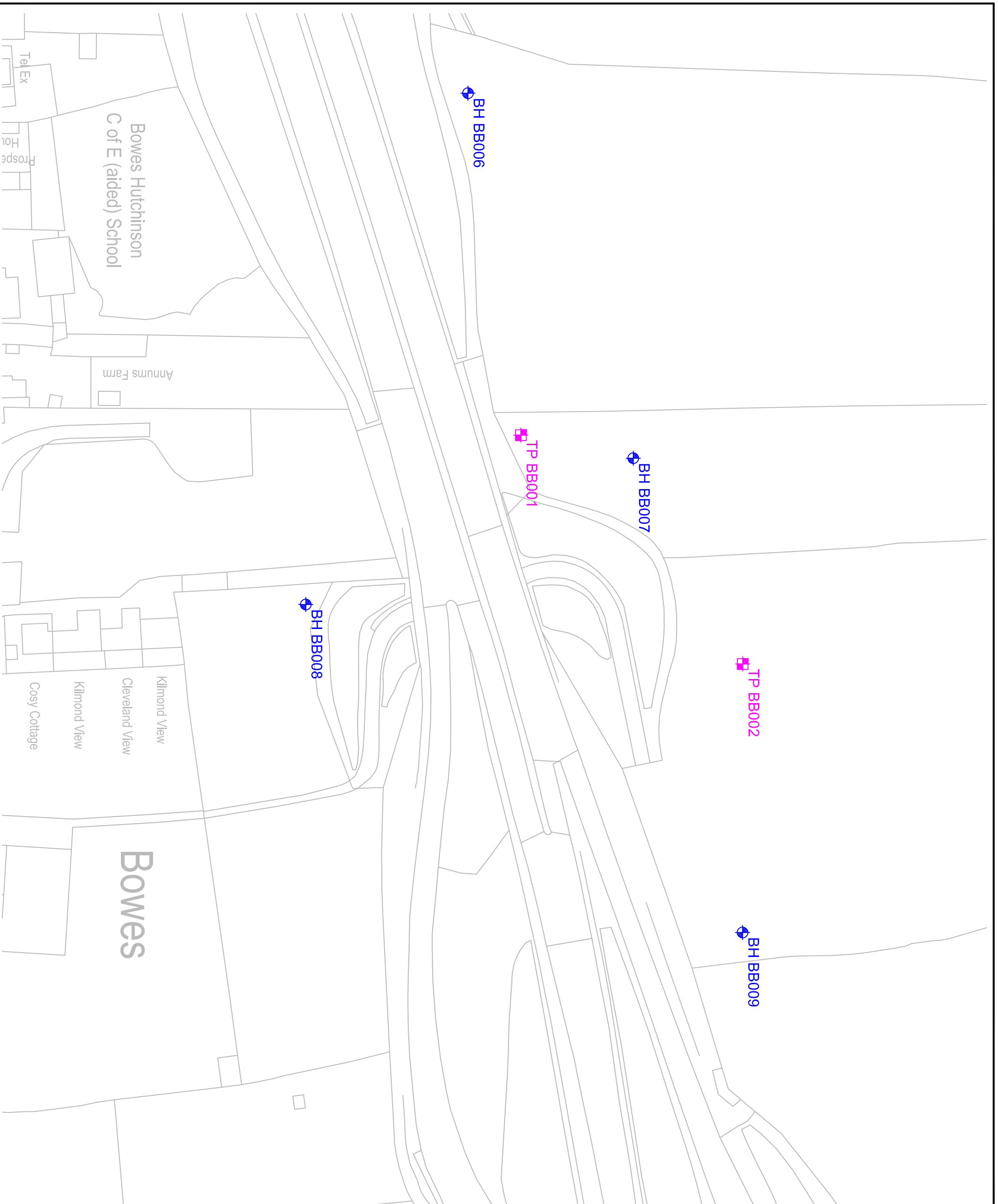
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
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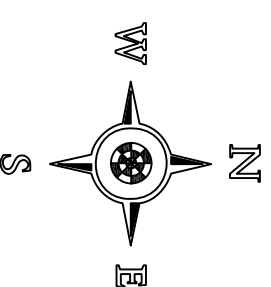




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/04

Contract Title:

A66 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcey Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

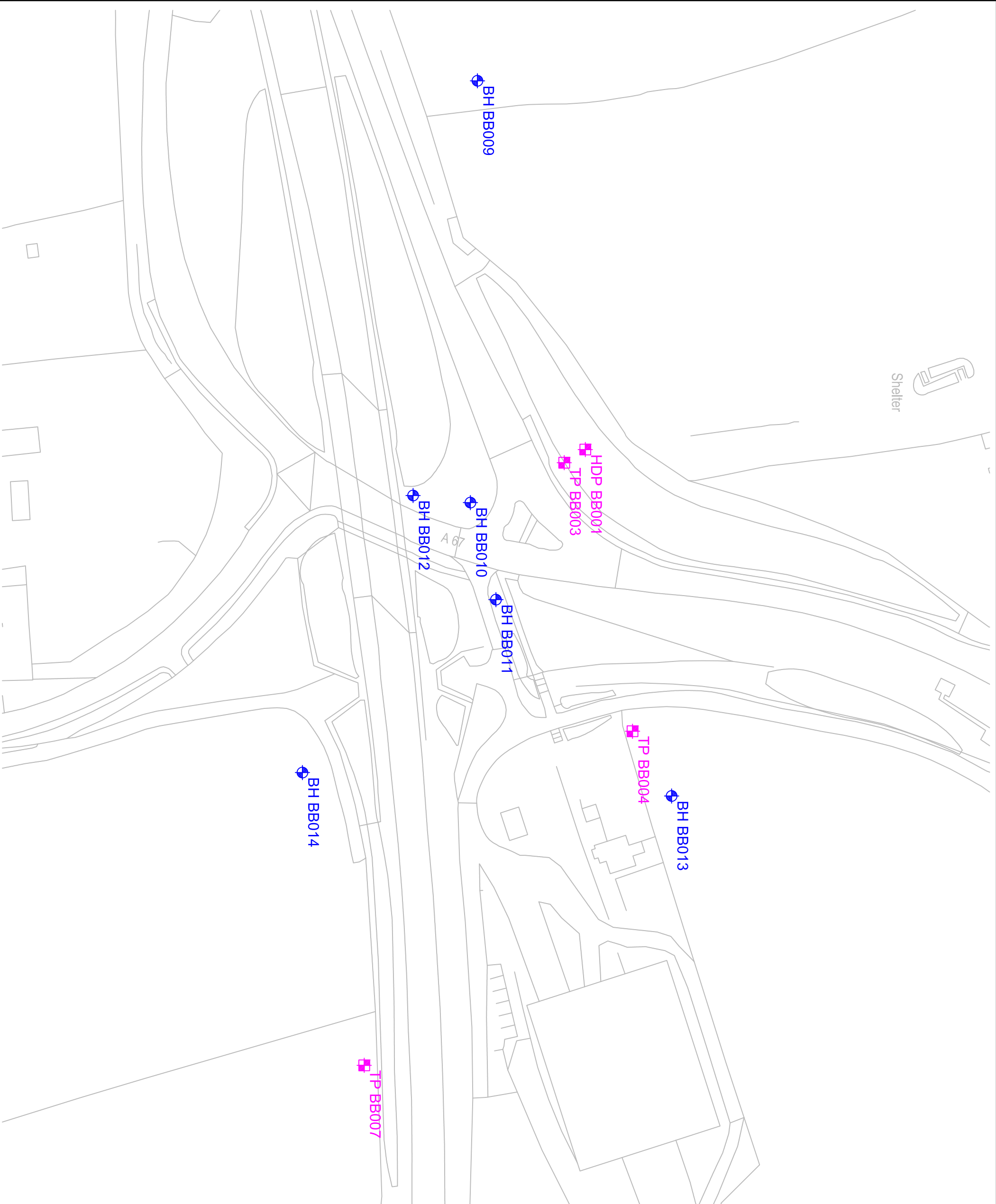
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Date:





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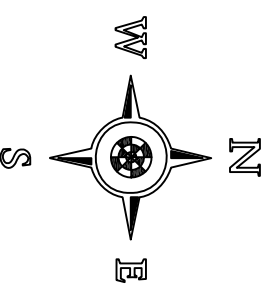




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/05

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Chancrey Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

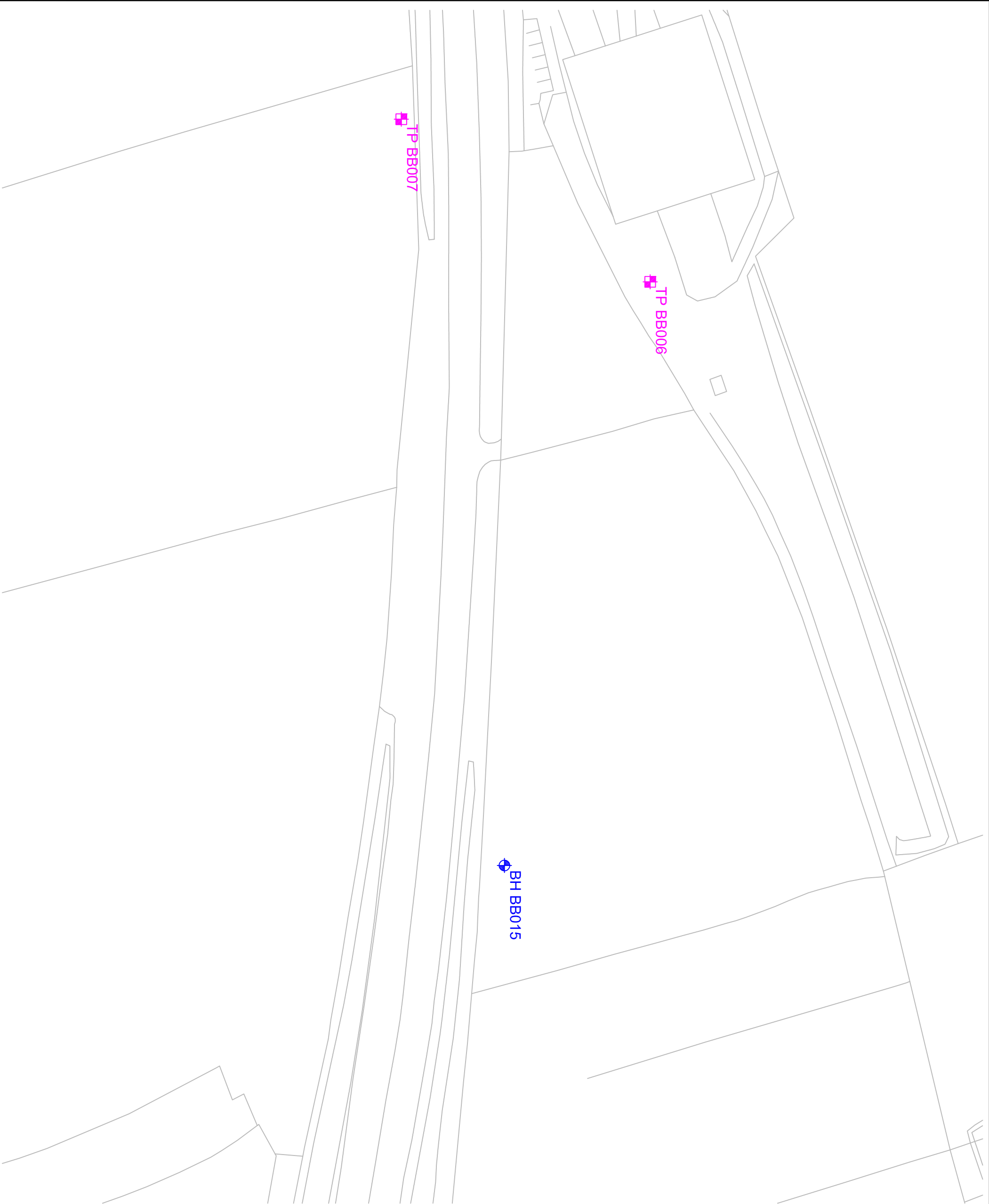
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
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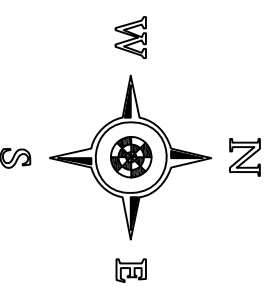




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 (Email: enquiries@aeaguk.net)

KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/06

Contract Title:

A66 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Chancery Exchange, 10 Funnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
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Contract No.:

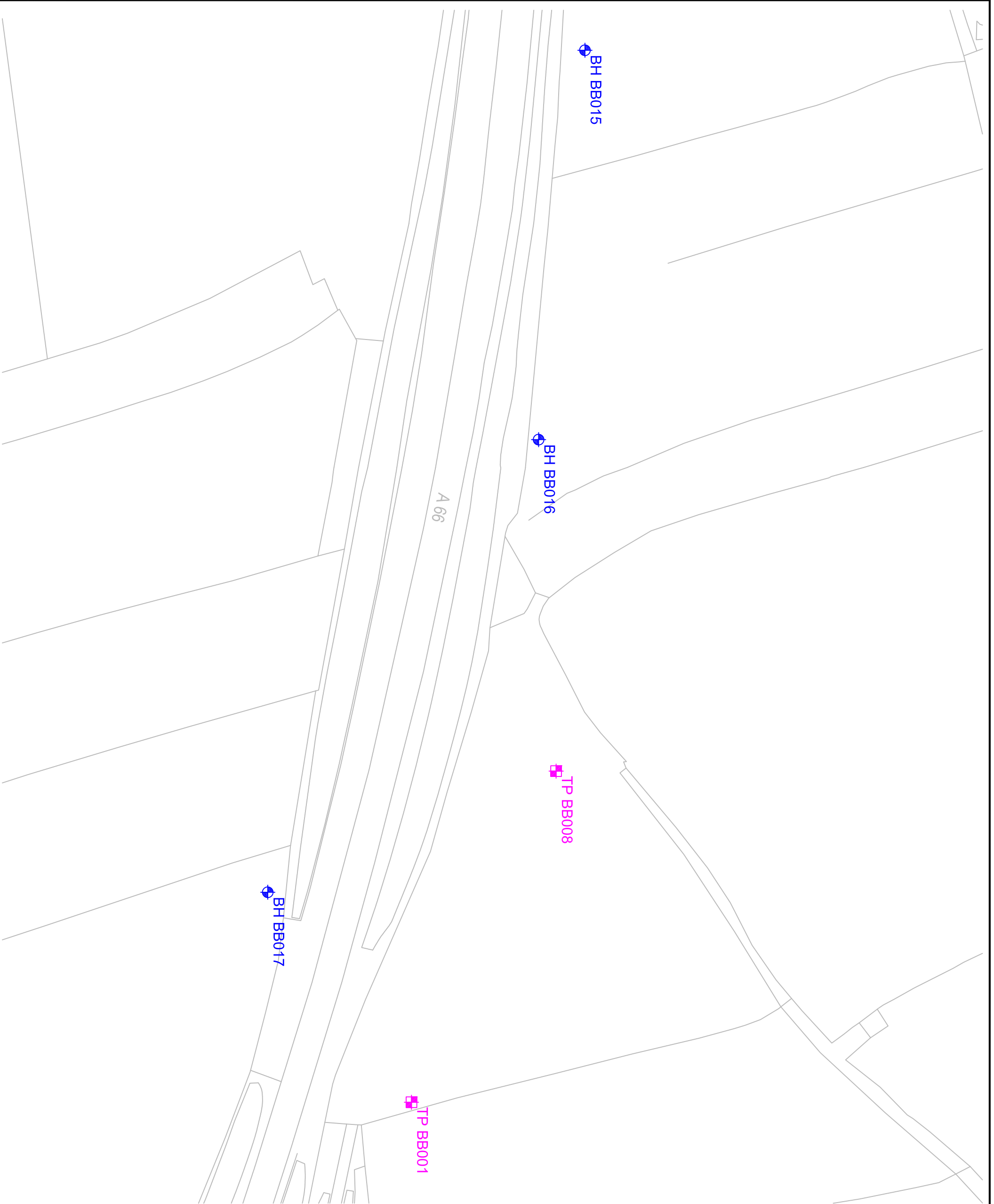
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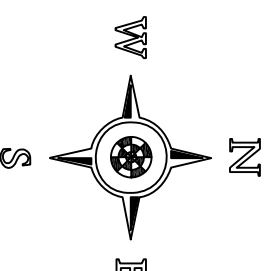




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/07

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Funnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

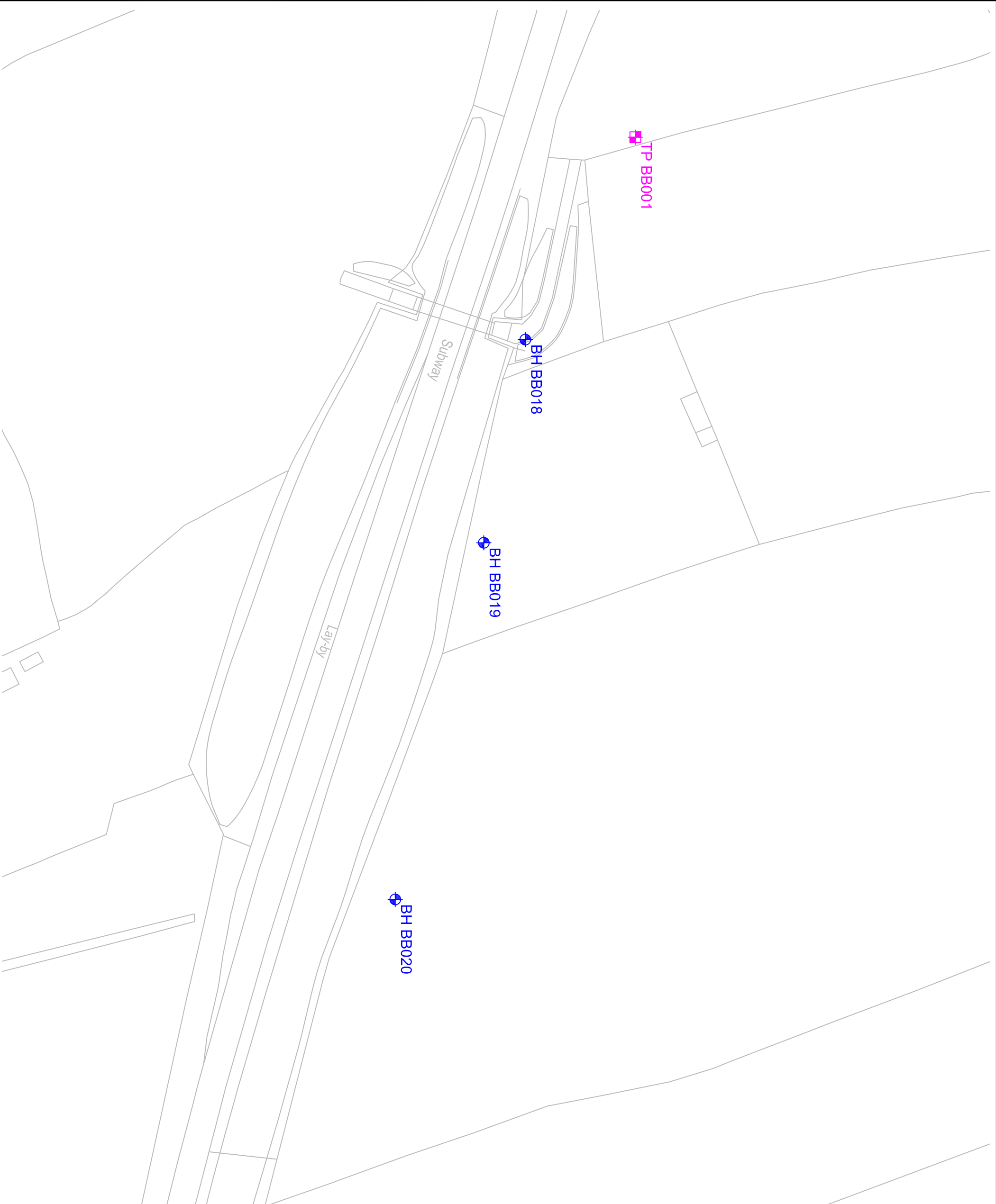
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
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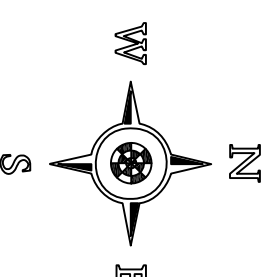




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 (Email): enquiries@aeaguk.net

KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/08

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Funnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

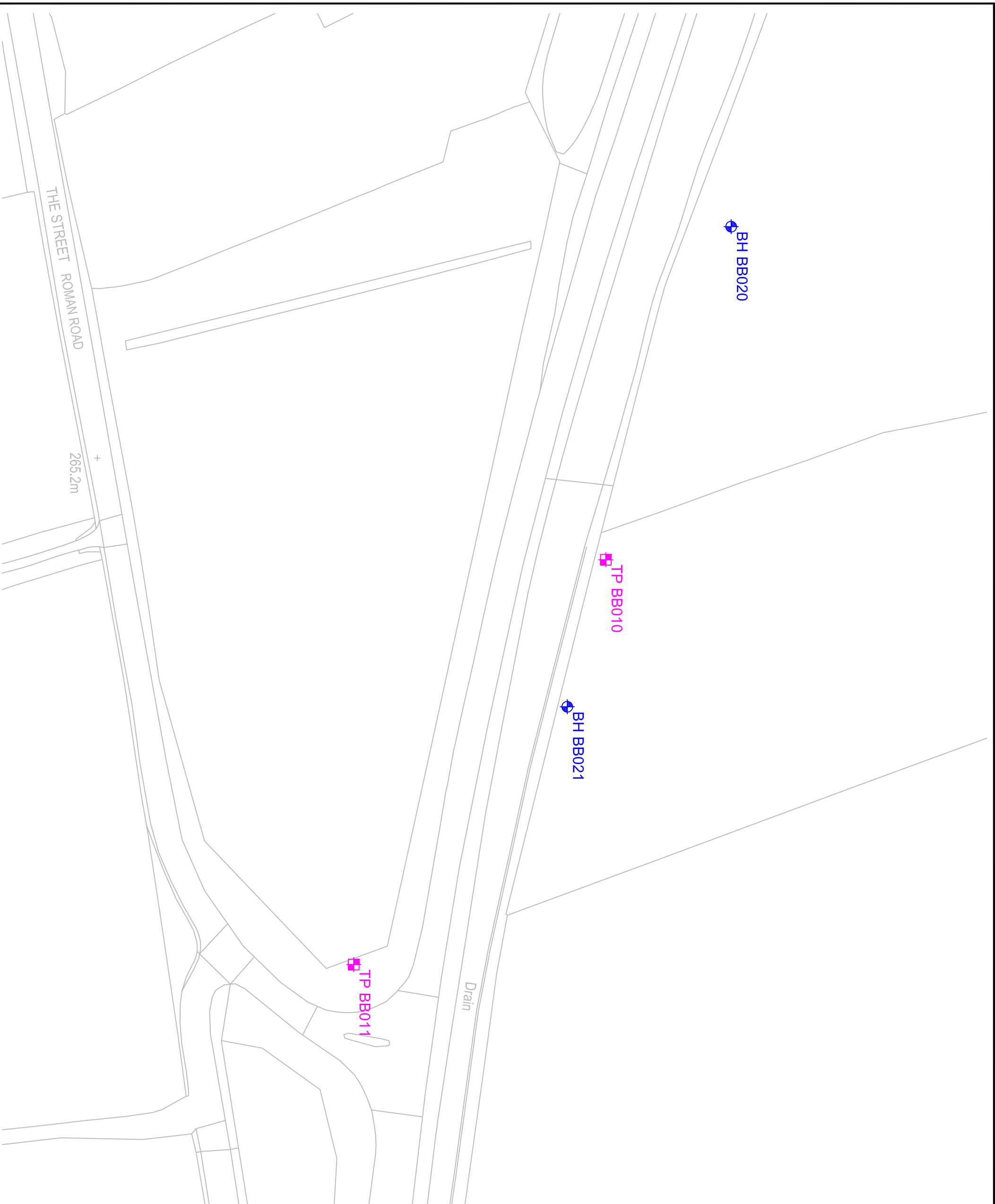
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
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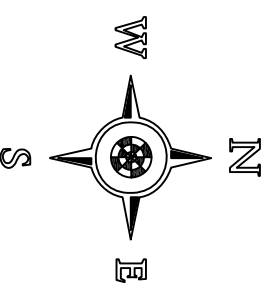




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/09

Contract Title:

A66 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

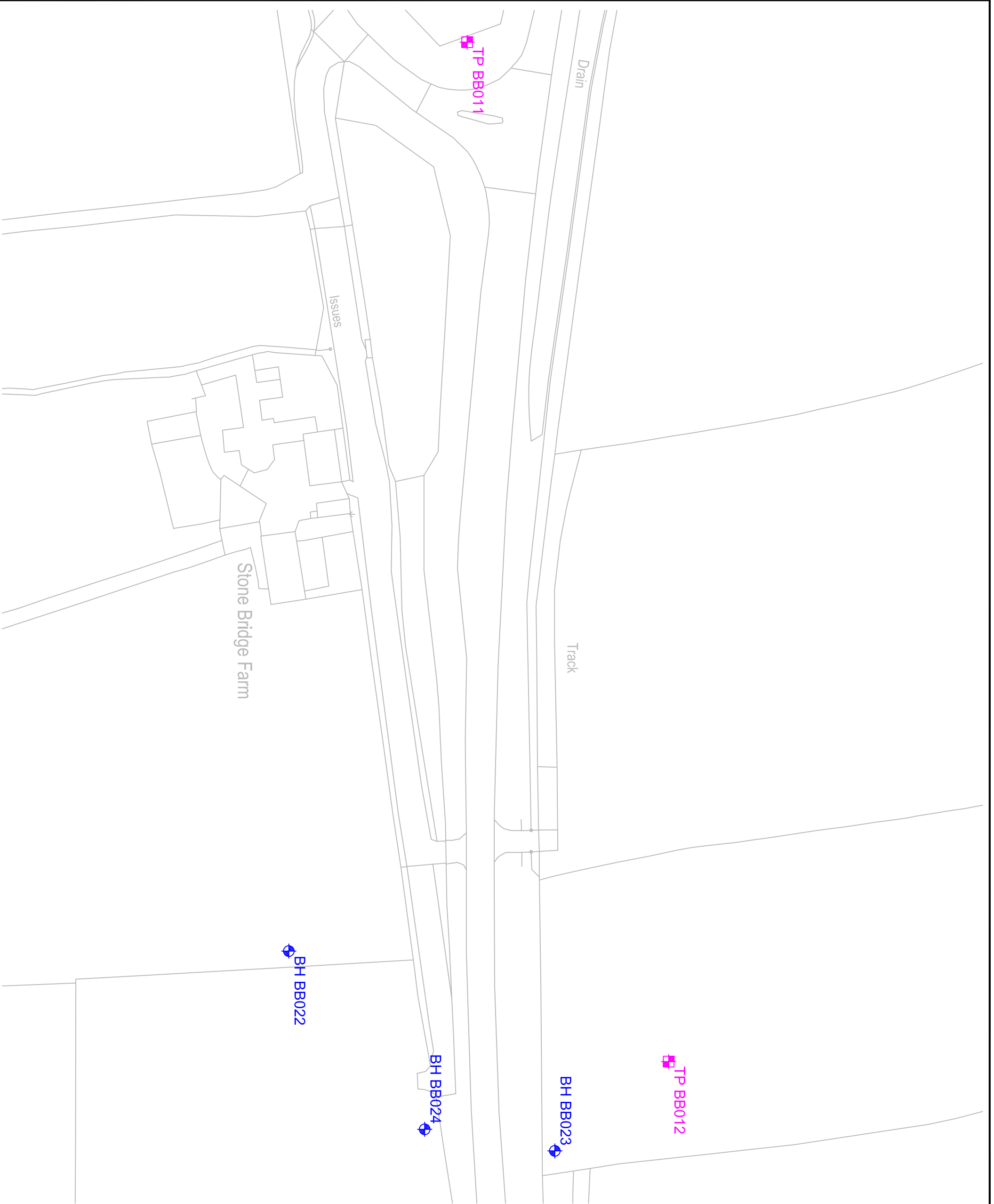
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
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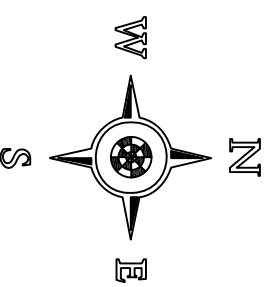




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KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:
ENC 01 : Exploratory Hole Location Plan

Drawing No.:
AEG4322C/10

Contract Title:
A66 North Trans Pennine Scheme D Section 7

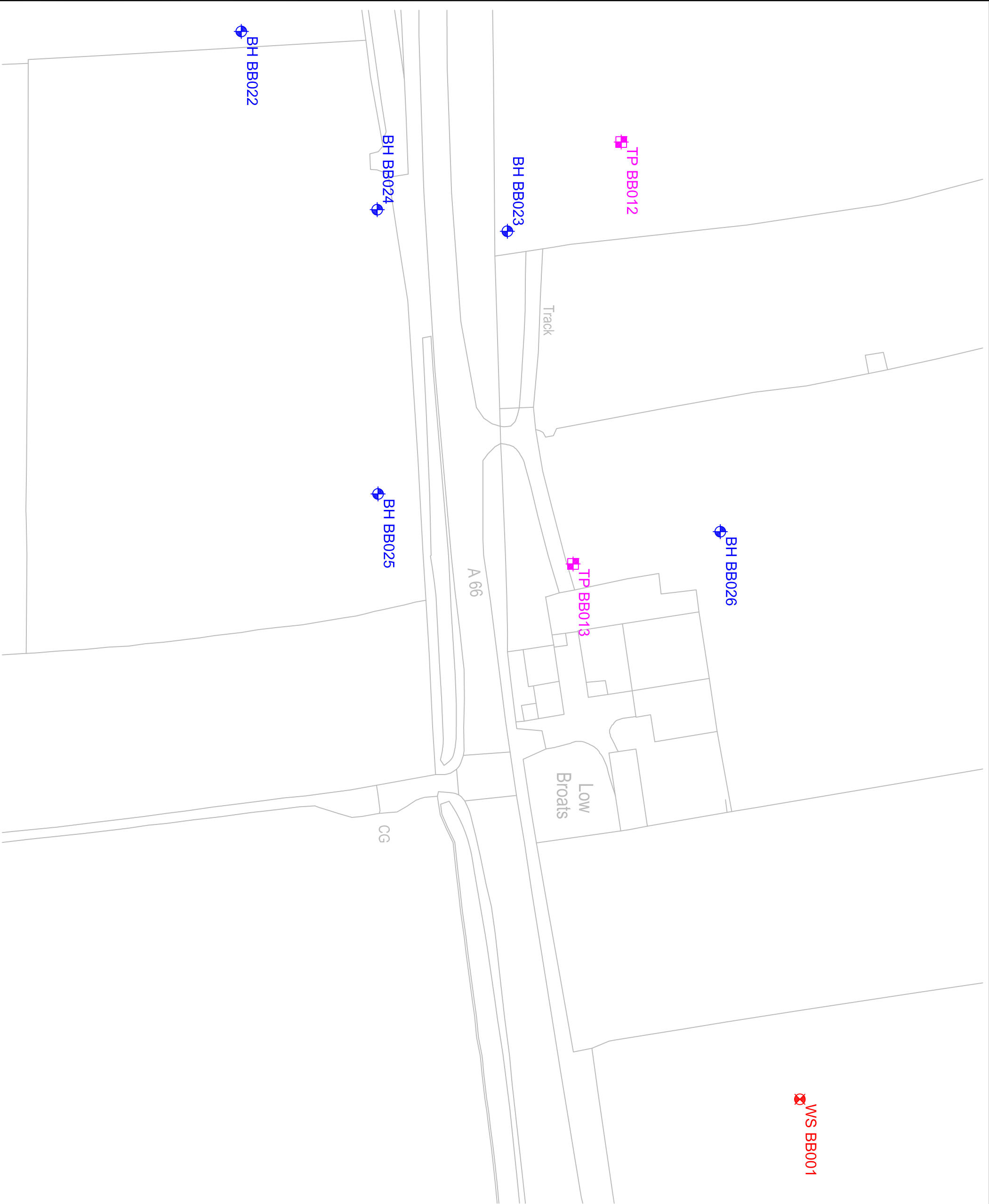
Client:
AMEY OW Limited
Charney Exchange, 10 Furnival Street,
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Consultant:
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Central Square, Forth Street,
Newcastle upon Tyne, NE1 3PL

Contract No.:
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
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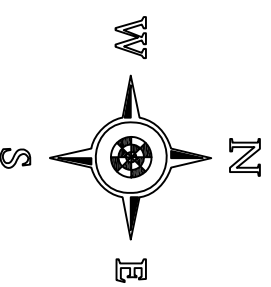




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KEY:

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-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/11

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Funnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

4322C

Scale:

1:1000 @ A3

Date:





19/03/2021

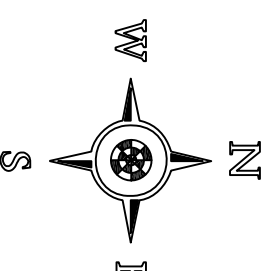




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KEY:

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-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/12

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

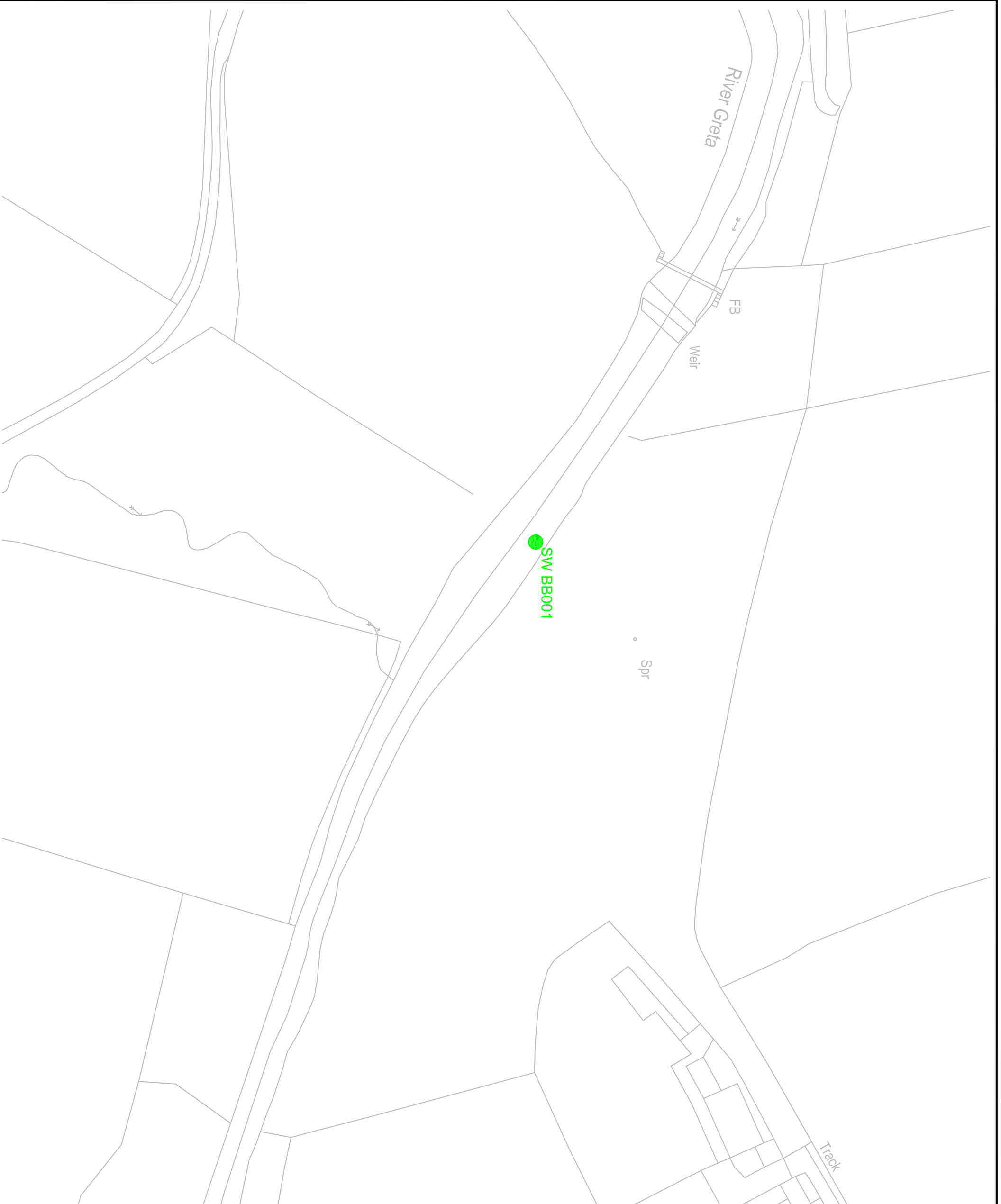
4322C

Scale:

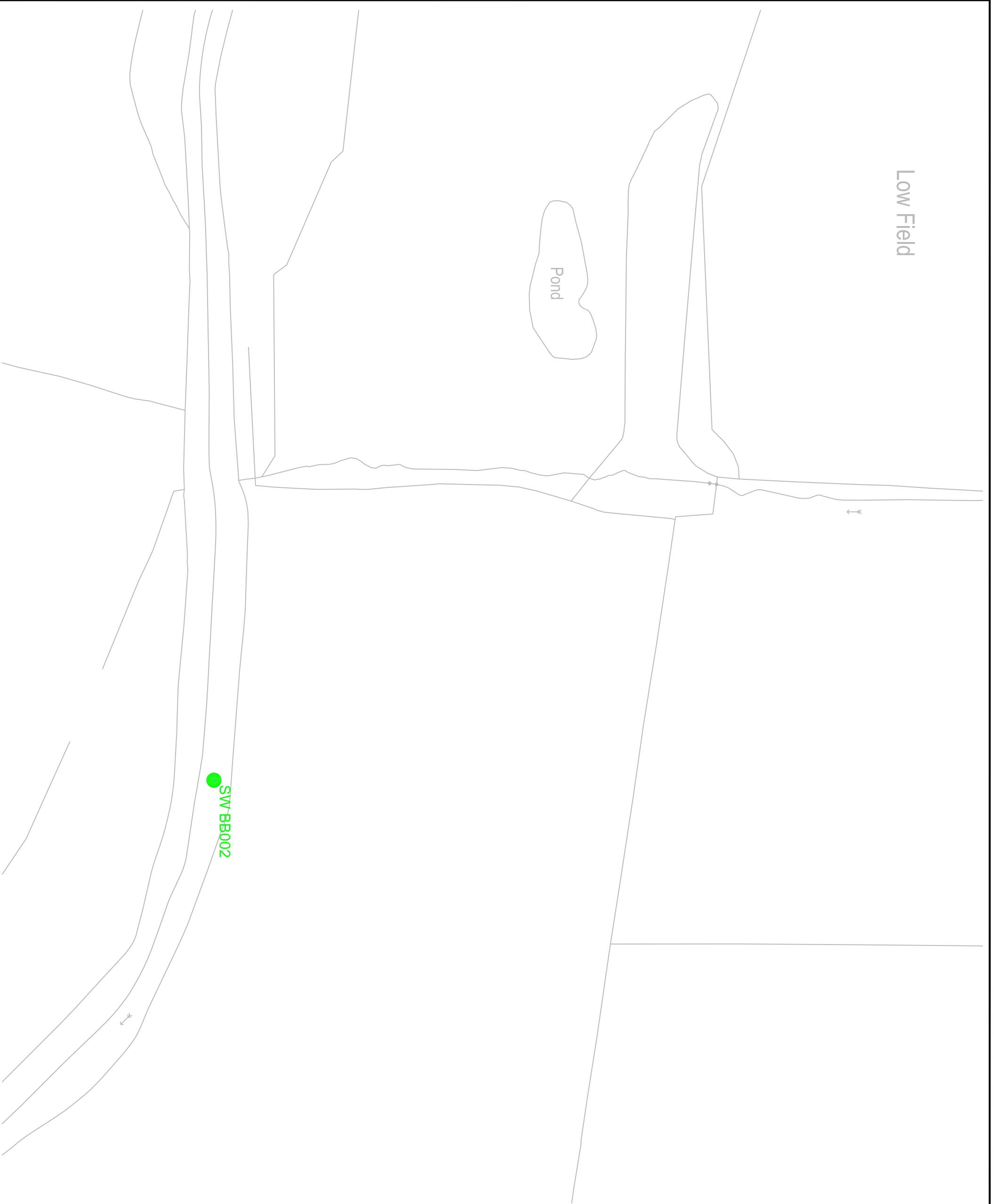
1:1000 @ A3

Date:

19/03/2021







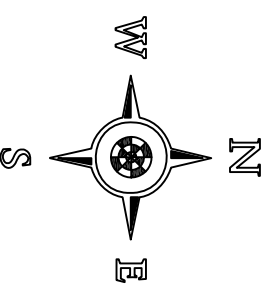
Low Field



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 Palton Fell
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 DH2 2RS
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 (Email: enquiries@aeguk.net)

KEY:

-  BOREHOLE
-  WINDOW/WINDOWLESS SAMPLE HOLE
-  TRIAL/INSPECTION PIT
-  SURFACE WATER SAMPLE



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 01 : Exploratory Hole Location Plan

Drawing No.:

AEG4322C/13

Contract Title:

A86 North Trans Pennine Scheme D Section 7

Client:

AMEY OW Limited
 Charcoery Exchange, 10 Furnival Street,
 London, EC4A 1AB

Consultant:

Arup
 Central Square, Forth Street,
 Newcastle upon Tyne, NE1 3PL

Contract No.:

4322C

Scale:

1:1000 @ A3

Date:

19/03/2021

Borehole Records





ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB002	
Client: AMEY OW Limited		Location: E:398838.151 N:513606.272	
Method (Equipment): Rotary Openhole (Comacchio GEO 205)		Ground Level (m): 296.211	Start Date: 01/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1			295.91		0.30	MADE GROUND (Dark grey sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes dolomite, macadam and sandstone).	
0.30	ES2							
0.40	B3							
0.60	B4							
1.00	ES5					(2.00)	MADE GROUND (Firm to stiff dark grey slightly sandy slightly gravelly clay with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. Cobbles are subangular to subrounded and includes sandstone).	
1.70-2.15	SJ6	N22					at c.1.70m BGL ... clay is of low plasticity.	
2.00	B7							
2.30	J8			293.91		2.30		
2.50-2.95	SJ9	N6				(0.60)	Soft brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone. (Possibly Reworked).	
3.00	ES10A			293.31		2.90		
3.50-3.95	CB10	N14				(2.10)	Medium dense dark brown very clayey slightly sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.	
4.50-4.95	CB11	N14						
				291.21		5.00	Complete at 5.00m BGL.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
01/02/2021	0.00							(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 4.30m BGL. (4) Drilled using rotary coring drilling rig due to rig availability.
01/02/2021	5.00	4.50	150	3.00				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: J. Myall

Contract No. 4322C



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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB003	
Client: AMEY OW Limited		Location: E:398885.998 N:513564.334	
Method (Equipment): Openhole/Coring (Comacchio GEO 205)		Ground Level (m): 287.563	Start Date: 03/02/2021
		Sheet: 1 of 2	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1					(0.40)	MADE GROUND (Brown clayey very sandy gravel with many rootlets. Gravel is fine to medium subangular and includes sandstone and brick. Sand is fine to coarse).	
0.20	ES2			287.16		0.40		
0.40	B3						Stiff to very stiff grey slightly sandy slightly gravelly CLAY with high boulder content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Boulders are assumed to be rounded and include limestone and mudstone.	
0.80	ES4							
1.00	B5							
1.70-2.15	SJ6	N31						
2.10	B7							
2.50	SJ8	66/122mm						
3.00	B9							
3.50	SJ10	64/136mm						
4.50	SJ11	50/41mm				(8.40)		
6.00	SJ12	50/63mm						
7.50	SJ13	25/0mm						

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
03/02/2021	0.00	0.00	150					(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Borehole redrilled from 1.20-10.00m BGL to advance casing through boulders (04/02/2021). (4) 19mm diameter standpipe piezometer installed to 11.00m BGL. (5) Water strike at 8.50m BGL. (6) Drilled using rotary coring drilling rig due to rig availability.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB003	
Client: AMEY OW Limited		Location: E:398885.998 N:513564.334	
Method (Equipment): Openhole/Coring (Comacchio GEO 205)		Ground Level (m): 287.563	Start Date: 03/02/2021
		Sheet: 2 of 2	

SAMPLES & TESTS			STRATA				Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	
9.00	SJ14	125/72mm	↓	278.76		8.80	Stiff to very stiff grey slightly sandy slightly gravelly CLAY with high boulder content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Boulders are assumed to be rounded and include limestone and mudstone. <i>(continued)</i>
							(1.20)
10.00	SJ15	100/61mm		277.56		10.00	Boring complete at 10.00m BGL - continued by rotary drilling.

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
03/02/2021	10.00	2.50	140	7.69				(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Borehole redrilled from 1.20-10.00m BGL to advance casing through boulders (04/02/2021). (4) 19mm diameter standpipe piezometer installed to 11.00m BGL. (5) Water strike at 8.50m BGL. (6) Drilled using rotary coring drilling rig due to rig availability.

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D. Portsmouth

Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB003	
Client: AMEY OW Limited	Location: E:398885.998 N:513564.334		
Method (Equipment): Openhole/Coring (Comacchio GEO 205)	Ground Level (m): 287.563	Start Date: 03/02/2021	Sheet: 1 of 3

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
10.00 (92mm)	80 (80) 0	NR 13		277.56		10.00	10.00-10.10m ... no recovery. 10.10-12.00m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.	Moderately weak to medium strong grey black carbonate MUDSTONE partially weathered.	
10.50 (92mm)	100 (100) 14					(1.50)			
11.20 (92mm)	100 (100) 38			276.06		11.50		Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE/muddy LIMESTONE partially weathered.	
12.00 (92mm)	93 (93) 63	NR 7					12.00-12.10m ... no recovery. 12.10-15.00m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.		
13.50 (92mm)	100 (100) 87					(3.50)			

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
04/02/2021	10.00	2.50	4.69				10.00 - 10.50	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Borehole redrilled from 1.20-10.00m BGL to advance casing through boulders (04/02/2021). (4) 19mm diameter standpipe piezometer installed to 11.00m BGL. (5) Water strike at 8.50m BGL. (6) Drilled using rotary coring drilling rig due to rig availability.
04/02/2021	12.00	10.00	8.16				10.50 - 11.20	Air/Mist	100	
05/02/2021	12.00	10.00	7.40				11.20 - 12.00	Air/Mist	100	
							12.00 - 13.50	Air/Mist	100	
							13.50 - 15.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D. Portsmouth

Contract No. 4322C



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB003	
Client: AMEY OW Limited		Location: E:398885.998 N:513564.334	
Method (Equipment): Openhole/Coring (Comacchio GEO 205)		Ground Level (m): 287.563	Start Date: 03/02/2021
			Sheet: 2 of 3

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
(92mm)				272.56		15.00		Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE/muddy LIMESTONE partially weathered. (continued)	
								Complete at 15.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
05/02/2021	15.00	10.00	7.40							(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Borehole redrilled from 1.20-10.00m BGL to advance casing through boulders (04/02/2021). (4) 19mm diameter standpipe piezometer installed to 11.00m BGL. (5) Water strike at 8.50m BGL. (6) Drilled using rotary coring drilling rig due to rig availability.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	by: [Redacted]	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-

FINAL

Project:	A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB003			
Client:	AMEY OW Limited	Location:	E:398885.998 N:513564.334				
Method (Equipment):	Openhole/Coring (Comacchio GEO 205)	Ground Level (m):	287.563	Start Date:	03/02/2021	Sheet:	3 of 3

Figure BH BB003.1
BH BB003 - 10.00-12.00m BGL



Figure BH BB003.2
BH BB003 - 12.00-15.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB004	
Client: AMEY OW Limited	Location: E:398947.771 N:513636.085		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 288.734	Start Date: 17/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.50	ES0			288.63		0.10	TOPSOIL (Soft dark brown sandy slightly gravelly clay with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone).	
0.70	ES1			288.13		0.60	MADE GROUND (Grey slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular to angular and includes dolomite and limestone).	
0.70	J2							
0.70-1.00	B3							
1.00	ES4					(1.00)	Soft grey mottled orange brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.	
1.00	J5							
1.20-1.65	B7							
1.20-1.65	SJ6	N12		287.13		1.60	Firm dark greyish brown slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone, mudstone and limestone.	
2.00	U*8	(50)					(Driller notes gravel bands with cobbles). at c.2.50m BGL ... clay is of low plasticity.	
2.40	ES10A							
2.50-2.95	B10							
2.50-2.95	SJ9	N20	↓					
3.50	U*11	(50)				(3.90)		
4.00-4.45	B13						at c.4.00m BGL ... very clayey sandy gravel with a high cobble content. Clay fines are of low plasticity.	
4.00-4.45	SJ12	N37	↓					
5.00	U*14	(50)					between c.5.20-5.50m BGL ... driller notes obstruction.	
5.50	SJ15	100/20mm		283.23		5.50	at c.5.50m BGL ... clay is of low plasticity. <i>Terminated at 5.50m BGL - due to obstruction.</i>	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
17/02/2021	0.00	0.00	150		3.70 - 4.00	0:30		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 4.20m - water level rose to 2.83m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.
17/02/2021	5.50	5.40	150	2.36	5.20 - 5.50	1:00		

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Myall	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB005	
Client: AMEY OW Limited		Location: E:399075.055 N:513698.861	
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 292.732	Start Date: 18/02/2021	Sheet: 1 of 2

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-0.30	B3			292.43		0.30	TOPSOIL (Soft dark brown sandy slightly gravelly clay with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subrounded and include sandstone and mudstone).	
0.20	ES1							
0.20	J2							
0.60	HSV	45 (23)kPa					(0.90)	Soft grey mottled orange brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.
1.00	ES4				291.53		1.20	at c.1.00m BGL ... clay/silt fines are of high plasticity.
1.00	J5							
1.00-1.20	B6							
1.20-1.65	B8							
1.20-1.65	SJ7	N4						
1.20	HSV	44 (23)kPa						
2.00-2.45	B10							
2.00-2.45	SJ9	N8					(2.60)	
3.00-3.45	B12							
3.00-3.45	SJ11	N6						
3.50	ES12A			288.93		3.80	Very loose to loose grey brown very clayey/silty very sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone, mudstone and limestone.	
4.00-4.45	B14							
4.00-4.45	SJ13	N14						
5.00-5.45	CB15	N23						
6.00-6.45	CB16	N25				(4.70)		
7.00-7.45	CB17	N23						

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
18/02/2021	0.00	0.00	150				4.00 - 8.50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.80m - water level rose to 2.74m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 5.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	[Redacted]	Logged by: J. Myall	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB005	
Client: AMEY OW Limited		Location: E:399075.055 N:513698.861	
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m): 292.732	Start Date: 18/02/2021
		Sheet: 2 of 2	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
8.00-8.45	CB18	N25		284.23		8.50	Complete at 8.50m BGL.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
18/02/2021	8.50	7.80	150	0.11				(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.80m - water level rose to 2.74m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 5.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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ALLIED EXPLORATION & GEOTECHNICS LIMITED

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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB006	
Client: AMEY OW Limited	Location: E:399163.291 N:513717.945		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 291.887	Start Date: 19/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20 0.20-0.40	ES1 J2 B3			291.39		(0.50) 0.50	Brown very clayey slightly gravelly SAND with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse.	
0.70	HSV	37 (21)kPa				(0.70)	Soft to firm brown yellow slightly sandy CLAY. Sand is fine to medium.	
1.00 1.00-1.20 1.20-1.65 1.20-1.65	ES4 J5 B6 B8 SJ7	N10		290.69		1.20	at c.1.00m BGL ... clay is of intermediate plasticity.	
2.00-2.45	U*10	(30)				(2.10)	Firm brown yellow slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse subangular and includes mudstone and limestone. (Driller notes occasional cobbles).	
2.50-2.95 2.50-2.95	B12 SJ11	N11					at c.2.50m BGL ... clay is of intermediate plasticity.	
3.00	ES13			288.59		3.30		
3.50-3.95 3.50-3.95	B15 SJ14	N17					Medium dense grey very clayey sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes sandstone and limestone.	
4.00	ES16		↓			(1.50)		
4.50-4.95	U*17	(50)	↓	287.09		4.80	Grey brown sandy GRAVEL. Sand is fine to medium. Gravel is fine to medium subrounded and includes sandstone.	
5.00-5.45 5.00-5.45	B19 SJ18	N21		286.79		5.10	Weak grey MUDSTONE partially weathered. (Recovered as clayey gravel. Gravel is fine to coarse angular).	
6.00 6.00	B21 SJ20	100/40mm		285.79		6.10	Complete at 6.10m BGL.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
19/02/2021	0.00	0.00	150		5.70 - 6.00	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 4.80m - water level rose to 4.11m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 5.00m BGL.
19/02/2021	6.10	5.80	150	4.26				

All dimensions in metres Scale 1:50.00
 For explanation of symbols and abbreviations see Key Sheets
 : [Redacted]
 Logged by: D. Portsmouth
 Contract No. 4322C



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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited		Location: E:399265.479 N:513764.206	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.669	Start Date: 08/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.20	ES1	38 (20)kPa		291.37		0.30	Brown very clayey slightly gravelly SAND with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse.		
0.40	J2			0.90					Firm grey mottled orange slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone. at c.0.40m BGL ... clay/silt is of intermediate plasticity.
0.60	HSV								
0.70	B3								
1.20	ES4	N10		290.47		1.20	Firm to stiff grey slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles and boulders are assumed to be rounded and include limestone and mudstone. at c.1.50m BGL ... clay is of low plasticity.		
1.50-2.00	B6			(3.20)					
1.50-1.95	SJ5								
2.20	ES7								
2.40	J8	N20							
2.50-3.00	B10								
2.50-2.95	SJ9								
3.20	B11								
3.50-4.00	B13	50/199mm							
3.50-3.95	SJ12								
4.20	J14	50/10mm 100/29mm		287.27		4.40	Weak grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to medium angular). Boring complete at 4.60m BGL - continued by rotary drilling.		
4.50	SJ15			287.07		4.60			
4.60	SJ16								

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	200		2.40 - 2.50	0:45	0.00 - 4.60	
08/02/2021	1.20	0.00	200		4.50 - 4.60	1:00		
09/02/2021	1.20	0.00	200	Dry				
09/02/2021	4.60	4.60	200	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited		Location: E:399265.479 N:513764.206	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.669	Start Date: 08/02/2021
			Sheet: 1 of 7

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
4.60 (92mm)	0 (0) 0	NR		287.07		4.60	4.60-6.00m ... no recovery.	(1) Black MUDSTONE. (Driller describes as 'badly broken').	
5.10 (92mm)	0 (0) 0					(1.40)			
5.60 (92mm)	0 (0) 0						5.60-6.00m ... driller notes loss of flush to 50% returns.		
6.00 (92mm)	100 (33) 0	NI		285.67		6.00	6.00-7.45m ... non-intact.	Weak to moderately weak dark grey MUDSTONE partially weathered. 6.00-6.70m ... driller notes loss of flush to 0% returns.	
6.70 (92mm)	93 (40) 0						7.45-8.20m ... subhorizontal (5-20 degrees) and subvertical (45-65 degrees) closely spaced planar smooth and rough closed and infilled (clay) discontinuities.	6.70-8.20m ... driller notes loss of flush to 50% returns.	
8.20 (92mm)	100 (56) 0	NI					8.20-8.70m ... non-intact.	8.20-9.70m ... driller notes loss of flush to 80% returns.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
19/02/2021	4.60	4.60	0.20	5.10	C	50/87mm	4.60 - 5.10	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 10.00-12.00m BGL. (4) Redrilled between 3.00-4.60m BGL to straighten hole.
19/02/2021	5.60	4.60	Dry	5.60	C	50/157mm	5.10 - 5.60	Air/Mist	100	
22/02/2021	5.60	5.60	5.10	6.00	C	52/267mm	5.60 - 6.00	Air/Mist	50	
							6.00 - 6.70	Air/Mist	0	
							6.70 - 8.20	Air/Mist	50	
							8.20 - 9.70	Air/Mist	80	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

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Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited		Location: E:399265.479 N:513764.206	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.669	Start Date: 08/02/2021
		Sheet: 2 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
9.70	(92mm)	11				(5.35)	8.70-9.70m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open and closed infilled (clay) discontinuities.	Weak to moderately weak dark grey MUDSTONE partially weathered. (continued)	
10.70	(92mm)	18					9.70-10.20m ... non-intact.	9.70-10.70m ... driller notes loss of flush to 50% returns.	
12.20	(92mm)	7		280.32		11.35	10.20-10.70m ... subhorizontal (5-20 degrees) and subvertical (45-65 degrees) very closely spaced planar smooth and rough open and closed clean discontinuities.		
							10.70-11.35m ... non-intact.		
							11.35-12.20m ... subhorizontal (5-20 degrees) and oblique to subvertical (45-85 degrees) closely spaced planar undulating smooth and rough open and closed clean and stained (orange oxidation) discontinuities.	Medium strong grey fossiliferous LIMESTONE partially weathered.	
							12.20-12.45m ... non-intact.		
							12.45-13.70m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open and closed		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							9.70 - 10.70	Air/Mist	50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 10.00-12.00m BGL. (4) Redrilled between 3.00-4.60m BGL to straighten hole.
							10.70 - 12.20	Air/Mist	100	
							12.20 - 13.70	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

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Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
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Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited		Location: E:399265.479 N:513764.206	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.669	Start Date: 08/02/2021
		Sheet: 3 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
13.70	97 (97) 97	3				(3.85)	clean discontinuities.	Medium strong grey fossiliferous LIMESTONE partially weathered. (continued)	
15.20	100 (100) 97	2		276.47		15.20	13.70-15.20m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open and closed clean discontinuities.	Medium strong to strong grey fossiliferous LIMESTONE partially weathered.	
							15.20-16.70m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open and closed clean discontinuities.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							13.70 - 15.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 10.00-12.00m BGL. (4) Redrilled between 3.00-4.60m BGL to straighten hole.
							15.20 - 16.70	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited		Location: E:399265.479 N:513764.206	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.669	Start Date: 08/02/2021
		Sheet: 4 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description			
							Discontinuity Detail		Main	
16.70	100 (100) 83	7				(4.50)	16.70-18.20m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open and closed clean and stained (orange oxidation) discontinuities.	Medium strong to strong grey fossiliferous LIMESTONE partially weathered. (continued)		
18.20	100 (100) 47	11					18.20-19.70m ... subhorizontal (5-20 degrees) and subvertical (65-85 degrees) medium spaced planar smooth and rough open and closed clean and stained (orange oxidation) discontinuities.			
				271.97		19.70			Complete at 19.70m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
22/02/2021	19.70	9.50	Dry				16.70 - 18.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm diameter slotted standpipe installed between 10.00-12.00m BGL. (4) Redrilled between 3.00-4.60m BGL to straighten hole.
							18.20 - 19.70	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

by: [Redacted]

Logged by: D.P./R.C.

Contract No. 4322C



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DRILLHOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB007	
Client: AMEY OW Limited	Location: E:399265.479 N:513764.206		Sheet: 5 of 7
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 291.669	Start Date: 08/02/2021	

Figure BH BB007.1
BH BB007 - 4.60-8.20m BGL



Figure BH BB007.2
BH BB007 - 8.20-10.70m BGL





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DRILLHOLE RECORD

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Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB007
Client: AMEY OW Limited	Location: E:399265.479 N:513764.206		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 291.669	Start Date: 08/02/2021	Sheet: 6 of 7

Figure BH BB007.3
BH BB007 - 10.70-13.70m BGL



Figure BH BB007.4
BH BB007 - 13.70-16.70m BGL





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DRILLHOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB007
Client: AMEY OW Limited	Location: E:399265.479 N:513764.206		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 291.669	Start Date: 08/02/2021	Sheet: 7 of 7

Figure BH BB007.5
BH BB007 - 16.70-19.70m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB008	
Client: AMEY OW Limited		Location: E:399306.435 N:513672.558	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.185	Start Date: 08/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20 0.30	ES1 J2					(0.70)	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
0.60	ES3			290.49		0.70	Firm grey mottled orange slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone.	
1.00 1.20	B4 ES5					(1.40)		
1.50-1.95	U6	(37)						
2.00 2.10	J7 ES8			289.09		2.10	at c.2.00m BGL ... clay is of intermediate plasticity.	
2.50-3.00 2.50-2.95 2.60	B11 SJ10 B9	N42				(1.90)	Firm to stiff grey slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Sand is fine to medium. Gravel is fine to medium subangular and include mudstone and limestone. Cobbles and boulders are assumed to be rounded and include limestone and mudstone.	
3.20	J12							
3.50-4.00 3.50-3.95	B14 SJ13	50/103mm		287.19		4.00		
4.20 4.30	J15 SJ16	100/63mm				(0.70)	Weak grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to medium angular).	
				286.48		4.70	Boring complete at 4.70m BGL - continued by rotary drilling.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150		4.00 - 4.30	1:00	1.20 - 2.30	
08/02/2021	1.20	0.00	150					
11/02/2021	1.20	0.00	150	Dry				
11/02/2021	4.70	4.30	150	1.80				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./M.B.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB008	
Client: AMEY OW Limited		Location: E:399306.435 N:513672.558	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.185	Start Date: 08/02/2021
		Sheet: 1 of 5	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
								Discontinuity Detail	Main
4.70 (92mm)	0 (0) 0	NR		286.48		4.70 (0.60)	4.70-5.30m ... no recovery.	(1) Black MUDSTONE with very soft bands. (Driller describes as 'badly broken'). 4.70-5.30m ... driller notes loss of flush returns to 80%.	
5.30 (92mm)	100 (6) 0	NI		285.89		5.30 (0.70)	5.30-6.60m ... non-intact.	Weak thinly laminated blackish grey MUDSTONE destructured to residual. (Recovered as sand and gravel). 5.30-6.00m ... driller notes loss of flush returns to 50%.	
6.00 (92mm)	100 (0) 0			285.19		6.00		Weak to medium strong thinly laminated blackish grey MUDSTONE distinctly weathered. 6.00-6.50m ... driller notes loss of flush returns to 90%.	
6.50 (92mm)	100 (19) 0	20				6.50 (1.50)	6.60-7.20m ... horizontal (0-5 degrees) very closely spaced planar smooth tight stained (soft grey sandy clay) discontinuities.		
7.50 (92mm)	67 (7) 0	NR		283.69		7.50 (0.50)	7.20-7.50m ... non-intact.		
		NI					7.50-8.00m ... no recovery.	(1) Black MUDSTONE with very soft bands. (Driller describes as 'badly broken'). 7.50-9.50m ... driller notes loss of flush returns to 80%.	
		NI		283.19		8.00 (1.00)	8.00-9.50m ... non-intact.	Weak to medium strong thinly laminated blackish grey MUDSTONE distinctly weathered.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
18/02/2021	4.70	4.70	3.70	5.30	C	50/236mm	4.70 - 5.30	Air/Mist	80	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 2.30m - water level rose to 1.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 2.50m BGL.
							5.30 - 6.00	Air/Mist	50	
							6.00 - 6.50	Air/Mist	90	
							6.50 - 7.50	Air/Mist	100	
							7.50 - 9.00	Air/Mist	80	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./M.B.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB008	
Client: AMEY OW Limited		Location: E:399306.435 N:513672.558	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.185	Start Date: 08/02/2021
		Sheet: 2 of 5	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
9.00				282.19		9.00		Weak to medium strong thinly laminated blackish grey MUDSTONE distinctly weathered. (continued)	
9.50	100 (0) 0			281.69		(0.50)		Strong orange mottled blackish grey MUDSTONE destructured.	
10.50	100 (35) 28	6				(1.00)	9.50-10.50m ... horizontal (0-5 degrees) closely spaced planar undulating smooth light to moderately open stained (soft grey sandy clay) discontinuities.	Strong to very strong orange mottled blackish grey MUDSTONE partially weathered. 9.50-10.50m ... driller notes loss of flush returns to 70%.	
10.50				280.69		10.50	10.50-11.00m ... no recovery.	(1) Black MUDSTONE with very soft bands. (Driller describes as 'badly broken').	
10.90	67 (41) 32	NR		280.29		(0.40)			
11.00				280.19		11.00	11.00-11.50m ... horizontal (0-5 degrees) closely spaced undulating rough moderately open clean discontinuities.	(1) Grey LIMESTONE. (Driller describes as 'hard'). Very strong thinly bedded grey dark grey LIMESTONE partially weathered.	
12.00		12				(2.00)	11.50-13.00m ... horizontal (0-5 degrees) medium spaced undulating rough moderately open clean discontinuities.		
12.50	100 (100) 100	3							
	100 (92) 78								

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
				9.00	C	100/84mm	9.00 - 9.50	Air/Mist	80	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 2.30m - water level rose to 1.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 2.50m BGL.
				12.00	C	100/16mm	9.50 - 10.50	Air/Mist	70	
							10.50 - 12.00	Air/Mist	100	
							12.00 - 12.50	Air/Mist	100	
							12.50 - 13.50	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D.P./M.B.

Contract No. 4322C



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB008	
Client: AMEY OW Limited		Location: E:399306.435 N:513672.558	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 291.185	Start Date: 08/02/2021
		Sheet: 3 of 5	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
13.50	100 (100) 91	8		278.19		13.00	13.00-13.60m ... horizontal (0-5 degrees) closely spaced undulating rough moderately open clean discontinuities.	Very strong thinly bedded grey dark grey LIMESTONE partially weathered. (continued)	
						(0.60)		Very strong to extremely strong thinly bedded MUDSTONE/LIMESTONE interbeds partially weathered.	
(92mm)		4		277.59		13.60	13.60-15.00m ... horizontal to subhorizontal (0-30 degrees) medium spaced undulating rough moderately open to open clean discontinuities.	Very strong thinly bedded grey LIMESTONE partially weathered.	
						(1.40)			
				276.19		15.00		Complete at 15.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
18/02/2021	15.00	4.70	8.12				13.50 - 15.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 2.30m - water level rose to 1.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 2.50m BGL.

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

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Contract No. 4322C



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB008	
Client: AMEY OW Limited	Location: E:399306.435 N:513672.558		Sheet: 4 of 5
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 291.185	Start Date: 08/02/2021	

Figure BH BB008.1
BH BB008 - 4.70-7.50m BGL



Figure BH BB008.2
BH BB008 - 7.50-10.50m BGL





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DRILLHOLE RECORD

Status:-
FINAL

Project:	A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB008			
Client:	AMEY OW Limited	Location:	E:399306.435 N:513672.558				
Method (Equipment):	Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m):	291.185	Start Date:	08/02/2021	Sheet:	5 of 5

Figure BH BB008.3
BH BB008 - 10.50-13.50m BGL



Figure BH BB008.4
BH BB008 - 13.50-15.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB009	
Client: AMEY OW Limited		Location: E:399398.261 N:513794.791	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 289.926	Start Date: 08/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.20 0.30	ES1 J2	38 (20)kPa	↓	289.63	○	0.30	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.		
0.50 0.70	HSV B3					x	(2.20)		Firm to stiff grey mottled orange slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone. (Driller notes cobbles). at c.0.30m BGL ... silt of extremely high plasticity.
1.00	ES4					x			at c.1.50m BGL ... clay is of low plasticity.
1.50-2.00 1.50-1.95	B6 SJ5	N41			x				
2.20	ES7				x				
2.50-2.95	U8	(100)	↓	287.43	○	2.50	Firm to stiff brown becoming grey slightly sandy gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone.		
3.00 3.20	J9 B10				○	(2.00)			
3.50-4.00 3.50-3.95	B12 SJ11	47/153mm			○				
4.20	J13				○				
4.50-5.00 4.50-4.95	B15 SJ14	50/126mm	↓	285.43	○	4.50	Very weak to weak grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to medium angular).		
5.30	SJ16	100/42mm		284.63	○	5.30	Boring complete at 5.30m BGL - continued by rotary drilling.		

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150		1.40 - 1.50	0:45	1.20 - 5.00	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 5.00m - water level rose to 2.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 6.50m BGL.
08/02/2021	1.20	0.00	150		4.90 - 5.30	1:00		
10/02/2021	1.20	0.00	150	Dry				
10/02/2021	5.30	5.30	150	2.80				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	[REDACTED]	Logged by: D.P./M.B.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB009	
Client: AMEY OW Limited		Location: E:399398.261 N:513794.791	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 289.926	Start Date: 08/02/2021
		Sheet: 1 of 3	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
5.30	0 (0) 0	NR		284.63		5.30 (0.30)	5.30-5.60m ... no recovery.	(1) Black MUDSTONE. (Driller describes as 'badly broken').	
5.60				284.33		5.60 (0.55)	5.60-6.15m ... non-intact.	Very weak thinly laminated bluish grey MUDSTONE residual. (Recovered as sand and gravel).	
6.00	100 (0) 0	NI				6.15 (0.75)	6.15-6.50m ... horizontal (0-5 degrees) and occasionally oblique (40 degrees) very closely spaced planar smooth very tight to tight stained (grey clay) discontinuities.	Weak thinly laminated bluish grey MUDSTONE destructured.	
	90 (25) 0	20		283.78		6.90 (1.40)	6.50-6.90m ... non-intact.		
7.00		NR		283.03		7.00	6.90-7.00m ... no recovery.	(1) Black MUDSTONE. (Driller describes as 'badly broken').	
		NI		282.93		7.50 (0.95)	7.00-7.95m ... non-intact.	Weak thinly laminated bluish grey MUDSTONE destructured.	
7.50	100 (14) 0	NI				7.95 (1.40)	7.95-9.00m ... horizontal (0-5 degrees) closely spaced planar smooth tight clean discontinuities.	Weak to medium strong thinly laminated bluish black MUDSTONE distinctly weathered.	
	100 (30) 0	16		281.98		9.00	9.00-9.45m ... non-intact.		
9.00									
	100 (48) 37	NI							

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
19/02/2021	5.30	5.30		5.60	C	50/251mm	5.30 - 5.60	Air/Mist	0	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 5.00m - water level rose to 2.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 6.50m BGL.
							5.60 - 6.00	Air/Mist	50	
							6.00 - 7.00	Air/Mist	100	
							7.00 - 7.50	Air/Mist	100	
							7.50 - 9.00	Air/Mist	100	
							9.00 - 10.50	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

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Contract No. 4322C



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB009	
Client: AMEY OW Limited		Location: E:399398.261 N:513794.791	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 289.926	Start Date: 08/02/2021
		Sheet: 2 of 3	

RUN DETAILS				STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description			
							Discontinuity Detail		Main	
(92mm)		12		280.58	(0.60)	9.35	9.45-9.90m ... horizontal (0-5 degrees) closely spaced planar smooth tight and infilled (sand and gravel) discontinuities.	Medium strong thinly laminated bluish black MUDSTONE residual. (Recovered as sand and gravel). Weak black MUDSTONE interbedded with strong light grey LIMESTONE distinctly weathered.		
				280.48		9.45				
				279.88		10.05				9.90-10.05m ... non-intact.
				279.43		10.50				10.05-10.50m ... subhorizontal (5-30 degrees) medium spaced undulating rough open to moderately open clean discontinuities.
		4			(0.45)			Strong to very strong grey dark grey LIMESTONE unweathered.		
								Complete at 10.50m BGL.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
19/02/2021	10.50	6.00								(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 5.00m - water level rose to 2.80m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 6.50m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./M.B.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB009	
Client: AMEY OW Limited	Location: E:399398.261 N:513794.791		Sheet: 3 of 3
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 289.926	Start Date: 08/02/2021	

Figure BH BB009.1
BH BB009 - 5.30-7.50m BGL



Figure BH BB009.2
BH BB009 - 7.50-10.50m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB010	
Client: AMEY OW Limited		Location: E:399516.023 N:513792.825	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 283.005	Start Date: 08/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.05	J1	50/48mm		282.71		0.30	MADE GROUND (Brown very clayey very gravelly sand with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and brick).	
0.05-0.30	B2			282.51		0.50		
0.20	ES3					(0.70)	MADE GROUND (Brown very clayey gravel. Gravel is fine to coarse subangular and includes limestone, macadam and mudstone).	
0.35	J4							
0.35-0.50	B5						Weak grey MUDSTONE partially weathered. (Recovered as gravel. Gravel is fine to coarse angular).	
0.40	ES6							
0.50	J7						Boring complete at 1.20m BGL - continued by rotary drilling.	
0.50-0.70	B8							
0.55	ES9							
1.20	C10					281.80		1.20

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150		1.00 - 1.20	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL
08/02/2021	1.20	1.10	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB010	
Client: AMEY OW Limited		Location: E:399516.023 N:513792.825	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 283.005	Start Date: 08/02/2021
		Sheet: 1 of 2	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
1.20 (92mm)	100 (50) 0	NI		281.80		1.20	1.20-1.60m ... non-intact.	Moderately weak fossiliferous grey black carbonate MUDSTONE partially weathered.	
						(0.80)	1.60-2.00m ... subhorizontal (10-15 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities		
2.00	0 (0) 0	NR		281.01		2.00	2.00-2.70m ... no recovery.	(1) MUDSTONE.	
2.50 (92mm)	80 (70) 0	NI		280.31		2.70	2.70-3.50m ... non-intact.	Moderately weak fossiliferous grey black carbonate MUDSTONE partially weathered.	
						(0.30)			
3.50 (92mm)	67 (53) 0	NR		279.01		3.00	3.50-4.00m ... no recovery.	(1) MUDSTONE.	
						(1.00)			
				278.01		4.00	4.00-4.30m ... subhorizontal (10 degrees) and vertical (85-90 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities	Moderately weak fossiliferous grey black carbonate MUDSTONE partially weathered.	
						(1.00)	4.30-4.50m ... non-intact.		
							4.50-5.00m ... subhorizontal and subvertical (10-20 degrees) very closely spaced planar and irregular rough undulating smooth and rough open clean discontinuities.		
							Complete at 5.00m BGL.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
15/02/2021	1.20	1.20	Dry	2.50	C	125/115mm	1.20 - 2.00	Air/Mist	100	
15/02/2021	2.00	1.20	Dry	5.00	C	125/68mm	2.00 - 2.50	Air/Mist	100	
16/02/2021	2.00	1.20	Dry				2.50 - 3.50	Air/Mist	100	
16/02/2021	5.00	1.20	Dry				3.50 - 5.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB010
Client: AMEY OW Limited	Location: E:399516.023 N:513792.825		
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)	Ground Level (m): 283.005	Start Date: 08/02/2021	Sheet: 2 of 2

Figure BH BB010.1
BH BB010 - 1.20-5.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB011	
Client: AMEY OW Limited		Location: E:399543.116 N:513799.947	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 283.418	Start Date: 08/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill		
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description			
0.20	ES1	100/30mm		283.22		0.20	MADE GROUND (Brown very clayey slightly gravelly sand with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and brick).			
0.40	B2			282.82		0.60			MADE GROUND (Brown clayey sandy gravel. Gravel is fine to coarse subangular and includes limestone, macadam and mudstone). Weak grey MUDSTONE partially weathered. (Recovered as gravel. Gravel is fine to coarse angular). <i>Boring complete at 1.20m BGL - continued by rotary drilling.</i>	
0.60	ES3					0.60				
0.80	J4					1.20				
1.20	SJ5									

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	140		0.80 - 1.20	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water seepage at 6.10m BGL. (4) 19mm diameter standpipe piezometer installed to 4.00m BGL.
08/02/2021	1.20	1.20	140					

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

by: [REDACTED]

Logged by: D. Portsmouth

Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB011	
Client: AMEY OW Limited		Location: E:399543.116 N:513799.947	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 283.418	Start Date: 08/02/2021
		Sheet: 1 of 7	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
							Discontinuity Detail	Main	
1.20 (92mm)	0 (0) 0	NR		282.22		1.20	1.20-1.70m ... no recovery.	(1) MUDSTONE/LIMESTONE.	
1.70 (92mm)	100 (100) 0	NI				(1.10)	1.70-2.30m ... non-intact.		
		17		281.12		2.30	2.30-2.70m ... subhorizontal (10-15 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.	Moderately weak becoming medium strong fossiliferous grey black carbonate MUDSTONE partially weathered.	
2.70 (92mm)	67 (67) 0	NR		280.72		2.70	2.70-3.20m ... no recovery.	(1) MUDSTONE/LIMESTONE.	
		17				(0.40)	3.20-3.40m ... subhorizontal (10 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.		
		NI		280.22		3.20	3.40-3.50m ... non-intact.		
		17				(0.50)	3.50-3.80m ... subhorizontal (10 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.		
		NI					3.80-4.00m ... non-intact.		
		17					4.00-4.20m ... subhorizontal (10 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.		
4.20 (92mm)	100 (80) 0	NI				(2.20)	4.20-4.40m ... non-intact.		
		17					4.40-4.70m ... subhorizontal (10 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.		
4.70	70 (70) 10	13					4.70-5.40m ... subhorizontal (10-15 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
12/02/2021	1.20	1.20	Dry	1.70	C	100/57mm	1.20 - 1.70	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water seepage at 6.10m BGL. (4) 19mm diameter standpipe piezometer installed to 4.00m BGL.
				4.20	C	100/71mm	1.70 - 2.70	Air/Mist	100	
							2.70 - 4.20	Air/Mist	100	
							4.20 - 4.70	Air/Mist	100	
							4.70 - 5.70	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	by: [Redacted]	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB011	
Client: AMEY OW Limited		Location: E:399543.116 N:513799.947	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 283.418	Start Date: 08/02/2021
		Sheet: 2 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
5.70		NR		278.02		5.40 (0.30)	5.40-5.70m ... no recovery.	(1) MUDSTONE/LIMESTONE.	
6.20	100 (100) 0	12		277.72		5.70	5.70-10.20m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.	Moderately weak becoming medium strong fossiliferous grey black carbonate MUDSTONE partially weathered.	
7.20	100 (100) 30								
8.70	100 (100) 47					(4.30)			

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							5.70 - 6.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water seepage at 6.10m BGL. (4) 19mm diameter standpipe piezometer installed to 4.00m BGL.
							6.20 - 7.20	Air/Mist	100	
							7.20 - 8.70	Air/Mist	100	
							8.70 - 10.20	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
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Client: AMEY OW Limited		Location: E:399543.116 N:513799.947	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 283.418	Start Date: 08/02/2021
		Sheet: 3 of 7	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
10.20	100 (100) 67	5		273.42		10.00		Moderately weak becoming medium strong fossiliferous grey black carbonate MUDSTONE partially weathered. (continued)	[Patterned Backfill]
11.70	100 (100) 93			271.72		11.70	10.20-13.90m ... subhorizontal (10-15 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.	Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE/muddy LIMESTONE unweathered.	
13.10	100							Medium strong to strong fossiliferous grey LIMESTONE unweathered.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
12/02/2021	11.70	1.20	5.69				10.20 - 11.70	Air/Mist	100	
15/02/2021	11.70	1.20	7.62				11.70 - 13.10	Air/Mist	100	
							13.10 - 14.30	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	by: [Redacted]	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
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Client: AMEY OW Limited		Location: E:399543.116 N:513799.947	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 283.418	Start Date: 08/02/2021
			Sheet: 4 of 7

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
14.30	(100) 71	9		268.42		(3.30)	13.90-15.00m ... subhorizontal and subvertical (10-80 degrees) closely spaced planar and irregular rough undulating smooth and rough open clean discontinuities.	Medium strong to strong fossiliferous grey LIMESTONE unweathered. (continued)	
	100 (100) 36					15.00		Complete at 15.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
15/02/2021	15.00	1.20	6.96				14.30 - 15.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water seepage at 6.10m BGL. (4) 19mm diameter standpipe piezometer installed to 4.00m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

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Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB011	
Client: AMEY OW Limited	Location: E:399543.116 N:513799.947		Sheet: 5 of 7
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 283.418	Start Date: 08/02/2021	

Figure BH BB011.1
BH BB011 - 1.20-4.70m BGL



Figure BH BB011.2
BH BB011 - 4.70-7.20m BGL





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Client: AMEY OW Limited	Location: E:399543.116 N:513799.947		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 283.418	Start Date: 08/02/2021	Sheet: 6 of 7

Figure BH BB011.3
BH BB011 - 7.20-10.20m BGL



Figure BH BB011.4
BH BB011 - 10.20-13.10m BGL





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DRILLHOLE RECORD

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Client: AMEY OW Limited	Location: E:399543.116 N:513799.947		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 283.418	Start Date: 08/02/2021	Sheet: 7 of 7

Figure BH BB011.5
BH BB011 - 13.10-15.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB012	
Client: AMEY OW Limited		Location: E:399514.039 N:513776.832	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.05 0.05-0.12 0.20 0.35 0.35-0.50 0.40	J1 B2 ES3 J4 B6 ES5			282.18		0.35	MADE GROUND (Brown very clayey very gravelly sand with many rootlets. Gravel is fine to medium subangular and includes sandstone and brick. Sand is fine to coarse). Moderately weak grey MUDSTONE distinctly weathered.	
						(0.85)		
1.20	C7	50/43mm		281.33		1.20	Boring complete at 1.20m BGL - continued by rotary drilling.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150		0.95 - 1.20	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.
08/02/2021	1.20	1.00	150	Dry				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D. Portsmouth

Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB012	
Client: AMEY OW Limited		Location: E:399514.039 N:513776.832	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
			Sheet: 1 of 8

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
							Discontinuity Detail	Main	
1.20 (92mm)	0 (0) 0	NR		281.33		1.20 (0.60)	1.20-1.80m ... no recovery.	(1) MUDSTONE with some soft bands.	
1.80 (92mm)	100 (0) 0	NI		280.73		1.80	1.80-3.50m ... non-intact.	Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE partially weathered.	
2.50 (92mm)	100 (40) 0					(1.70)			
3.50 (92mm)	0 (0) 0	NR		279.03		3.50 (0.60)	3.50-4.10m ... no recovery.	(1) MUDSTONE with some soft bands.	
4.10 (92mm)	100 (80) 20	NI		278.43		4.10	4.10-4.30m ... non-intact.	Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE partially weathered.	
5.10 (92mm)	100	7					4.30-7.10m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
09/02/2021	1.20	1.00	Dry	1.80	C	100/63mm	1.20 - 1.80	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.
				4.10	C	100/46mm	1.80 - 2.50	Air/Mist	100	
							2.50 - 3.50	Air/Mist	100	
							3.50 - 4.10	Air/Mist	100	
							4.10 - 5.10	Air/Mist	100	
							5.10 - 5.60	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
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Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB012	
Client: AMEY OW Limited		Location: E:399514.039 N:513776.832	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
		Sheet: 2 of 8	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
5.60	(100) 40					(3.00)		Moderately weak to medium strong fossiliferous grey black carbonate MUDSTONE partially weathered. (continued)	
7.10	100 (100) 27			275.43		7.10	7.10-8.60m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.	Medium strong to strong fossiliferous grey LIMESTONE unweathered.	
8.60	100 (100) 83	8					8.60-20.00m ... subhorizontal (10 degrees) medium spaced planar rough undulating smooth and rough open clean discontinuities.		
	100 (100) 97	3							

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							5.60 - 7.10	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.
							7.10 - 8.60	Air/Mist	100	
							8.60 - 10.10	Air/Mist	100	

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Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
			Sheet: 3 of 8

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
10.10	(92mm)							Medium strong to strong fossiliferous grey LIMESTONE unweathered. (continued)	
11.10	(92mm)	100 (100) 95							
12.60	(92mm)	100 (100) 97							
		100 (100) 90							

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
09/02/2021	10.10	1.20	4.69				10.10 - 11.10	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.
10/02/2021	10.10	1.20	5.11				11.10 - 12.60	Air/Mist	100	
							12.60 - 14.10	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
		Sheet: 4 of 8	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
14.10	100 (100) 0					(12.90)		Medium strong to strong fossiliferous grey LIMESTONE unweathered. (continued)	
14.30	100 (100) 87								
15.80	100 (100) 80								

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
10/02/2021	15.80	1.20	8.96				14.10 - 14.30	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.
11/02/2021	15.80	1.20	7.41				14.30 - 15.80	Air/Mist	100	
							15.80 - 17.30	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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Client: AMEY OW Limited		Location: E:399514.039 N:513776.832	
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)		Ground Level (m): 282.526	Start Date: 08/02/2021
		Sheet: 5 of 8	

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
17.30	100 (100) 97							Medium strong to strong fossiliferous grey LIMESTONE unweathered. (continued)	
18.80	100 (100) 96			262.53		20.00			
								Complete at 20.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
11/02/2021	20.00	1.20	7.41				17.30 - 18.80 18.80 - 20.00	Air/Mist Air/Mist	100 100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 8.00m BGL.

All dimensions in metres Scale 1:25.00
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Client: AMEY OW Limited	Location: E:399514.039 N:513776.832		Sheet: 6 of 8
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)	Ground Level (m): 282.526	Start Date: 08/02/2021	

Figure BH BB012.1
BH BB012 - 1.20-5.10m BGL



Figure BH BB012.2
BH BB012 - 5.10-8.10m BGL





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Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)	Ground Level (m): 282.526	Start Date: 08/02/2021	Sheet: 7 of 8

Figure BH BB012.3
BH BB012 - 8.10-11.10m BGL



Figure BH BB012.4
BH BB012 - 11.10-14.10m BGL





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Client: AMEY OW Limited	Location: E:399514.039 N:513776.832		Sheet: 8 of 8
Method (Equipment): Percussion/Coring (Dando 3000/Comacchio GEO 205)	Ground Level (m): 282.526	Start Date: 08/02/2021	

Figure BH BB012.5
BH BB012 - 14.10-17.30m BGL



Figure BH BB012.6
BH BB012 - 17.30-20.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB013	
Client: AMEY OW Limited		Location: E:399597.930 N:513848.958	
Method (Equipment): Cable Percussion (Dando 3000)	Ground Level (m): 290.791	Start Date: 08/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.05	J1			290.56		0.23	Brown clayey sandy GRAVEL with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
0.05-0.30	B2			290.34		0.45		
0.20	ES3	<0.1ppm					Brown very clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to medium subangular and include sandstone and mudstone.	
0.25	J4							
0.25-0.45	B5						Firm brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.0.50m BGL ... clay is of intermediate plasticity.	
0.30	PID	<0.1ppm						
0.50	J6						Firm brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.0.50m BGL ... clay is of intermediate plasticity.	
0.50-0.80	B7							
0.60	HSV	38 (20)kPa					Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
0.80	PID	<0.1ppm						
1.00	ES8						Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
1.30-1.75	U9	(100)						
2.00	J10						Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
2.00	PID	<0.1ppm						
2.35-2.80	B12			288.34		2.45	Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
2.35-2.80	SJ11	N26						
2.50	ES13						Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
3.10	J14							
3.40-3.90	B16						Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
3.40-3.45	SJ15	N32						
3.40	PID	<0.1ppm					Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.3.10m BGL ... clay is of low plasticity.	
4.00	ES17							
4.20	J18						at c.4.20m BGL ... clay is of low plasticity.	
4.40-4.90	B20							
4.40-4.85	SJ19	N38					between c.4.70-5.00m BGL ... obstruction.	
4.40	PID	<0.1ppm						
5.00	J21			285.79		5.00	Terminated at 5.00m BGL - due to obstruction.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150		1.60 - 1.90	0:45	1.30 - 2.80	
08/02/2021	1.20	0.00	150	Dry	4.70 - 5.00	0:45	3.10 - 5.00	
09/02/2021	1.20	0.00	150	Dry				
09/02/2021	2.80	2.80	150	Dry				
11/02/2021	2.80	2.80	150	Dry				
11/02/2021	5.00	3.10	150	Dry				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D. Portsmouth

Contract No. 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB014	
Client: AMEY OW Limited		Location: E:399591.392 N:513745.964	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 284.564	Start Date: 12/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	ES1			284.36		0.20	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular of sandstone and mudstone.	
0.30	B2							
0.60	HSV	37 (21)kPa					Firm grey orange mottled sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone.	
1.00	ES3					(1.80)		
1.50-1.95	U4	(46)					at c.1.50m BGL ... low becoming high strength. Clay is of low to intermediate plasticity.	
2.00	J5			282.56		2.00	Firm to stiff grey slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone.	
2.20	ES6						Cobbles are rounded and include limestone and mudstone.	
2.50-3.00	B8					(1.50)	at c.2.00m BGL ... clay is of intermediate plasticity.	
2.50-2.95	SJ7	N23						
3.20	J9							
3.50	SJ10	50/199mm		281.06		3.50	Weak grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to medium angular).	
3.70	SJ11	100/58mm				(0.60)		
				280.46		4.10	Boring complete at 4.10m BGL - continued by rotary drilling.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
12/02/2021	0.00	0.00	150		3.50 - 3.70	1:00	1.20 - 3.20	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 3.00m BGL.
12/02/2021	4.10	3.70	150	1.60				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D. Portsmouth

Contract No. **4322C**



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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB014	
Client: AMEY OW Limited		Location: E:399591.392 N:513745.964	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 284.564	Start Date: 12/02/2021
			Sheet: 1 of 4

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
4.10 (92mm)	0 (0) 0	NR		280.46		4.10	4.10-5.60m ... no recovery.	(1) Black grey MUDSTONE. (Driller describes as 'weak').	
4.60 (92mm)	0 (0) 0					(1.50)			
5.10 (92mm)	0 (0) 0								
5.60 (92mm)	100 (0) 0	NI		278.96		5.60	5.60-6.20m ... non-intact.	Weak to moderately weak fossiliferous grey black carbonate MUDSTONE partially weathered.	
6.10 (92mm)	100 (100) 0	25					6.20-8.50m ... subhorizontal (10 degrees) very closely spaced planar rough undulating smooth and rough open clean discontinuities.		
7.10 (92mm)	100 (100) 0								
7.60 (92mm)	100 (93) 13								

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
24/02/2021	4.10	4.10	Damp	4.60	S	N36	4.10 - 4.60	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 3.00m BGL.
24/02/2021	7.10	4.10	Damp	5.10	S	N38	4.60 - 5.10	Air/Mist	100	
25/02/2021	7.10	4.10	6.42	5.60	S	50/246mm	5.10 - 5.60	Air/Mist	100	
							5.60 - 6.10	Air/Mist	100	
							6.10 - 7.10	Air/Mist	100	
							7.10 - 7.60	Air/Mist	100	
							7.60 - 9.10	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB014	
Client: AMEY OW Limited		Location: E:399591.392 N:513745.964	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 284.564	Start Date: 12/02/2021
		Sheet: 2 of 4	

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
9.10	100 (80) 33	NI		273.96		(5.00)		Weak to moderately weak fossiliferous grey black carbonate MUDSTONE partially weathered. (continued)	
		8				8.50-8.60m ... non-intact. 8.60-9.35m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.			
		NI				9.35-9.65m ... non-intact.			
		9				9.65-10.60m ... subhorizontal (10 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.			
							10.60	Complete at 10.60m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
25/02/2021	10.60	4.10	Damp				9.10 - 10.60	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 3.00m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>K.W.</i>	Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB014	
Client: AMEY OW Limited	Location: E:399591.392 N:513745.964		Sheet: 3 of 4
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 284.564	Start Date: 12/02/2021	

Figure BH BB014.1
BH BB014 - 4.10-7.60m BGL



Figure BH BB014.2
BH BB014 - 7.60-9.10m BGL





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DRILLHOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB014
Client: AMEY OW Limited	Location: E:399591.392 N:513745.964		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 284.564	Start Date: 12/02/2021	Sheet: 4 of 4

Figure BH BB014.3
BH BB014 - 9.10-10.60m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB015	
Client: AMEY OW Limited	Location: E:399882.784 N:513792.177		
Method (Equipment): Cable Percussion (Dando 3000)	Ground Level (m): 287.201	Start Date: 08/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.05 0.05-0.12 0.20 0.20-0.50 0.30 0.60 0.75-0.90 0.80 1.00	J1 B2 ES3 B4 J5 HSV B6 J7 ES8	37 (21)kPa		287.03		0.17	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
1.30-1.80 1.30-1.75	B10 SJ9	N15		286.45		0.75	Friable brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
2.00 2.15 2.30-2.80 2.30-2.75	ES11 J12 B14 SJ13	N38		285.35		1.85	Firm brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.0.80m BGL ... clay is of low plasticity.	
3.10 3.25 3.40-3.90 3.40-3.85	J15 EW20 B17 SJ16	N47	↓			(3.25)	Firm to stiff grey slightly sandy very gravelly CLAY/clayey GRAVEL. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone. (Weathered Mudstone). at c.2.15m BGL ... clay is of low plasticity.	
4.10 4.40-5.10 4.40-4.85	J18 B21 SJ19	50/7170mm	↓	282.10		5.10	Complete at 5.10m BGL.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
08/02/2021	0.00	0.00	150				1.30 - 5.10	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 4.40m - water level rose to 3.35m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 2.00m BGL.
08/02/2021	1.20	1.20	150	Dry				
12/02/2021	1.20	1.20	150	Dry				
12/02/2021	5.10	3.10	150	Dry				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

by:

Logged by: D. Portsmouth

Contract No. 4322C



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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB016	
Client: AMEY OW Limited	Location: E:399992.177 N:513779.155		
Method (Equipment): Cable Percussion (Dando 3000)	Ground Level (m): 285.634	Start Date: 15/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.05	J1	37 (23)kPa		285.33		0.30	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and include sandstone and mudstone.	
0.05-0.25	B2							
0.20	ES3							
0.20-0.60	B4							
0.35	J5							
0.60	HSV	N17		284.73		0.90	Firm brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone. at c.0.35m BGL ... clay is of intermediate plasticity.	
1.00	ES6							
1.10	J7							
1.30-1.80	B9							
1.30-1.75	SJ8	50/25mm 50/32mm		283.23		2.40	Firm to stiff grey slightly sandy very gravelly CLAY/clayey gravel. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone. (Weathered Mudstone). at c.2.00m BGL ... clay is of low plasticity.	
2.00	J10							
2.20-2.40	B12							
2.20	SJ11	Terminated at 2.40m BGL - refusal/possible bedrock.						
2.40	C13							

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
15/02/2021	0.00	0.00	150		2.20 - 2.40	1:00	2.20 - 2.40	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
15/02/2021	2.40	1.80	150	2.10				

All dimensions in metres Scale 1:50.00
 For explanation of symbols and abbreviations see Key Sheets
 Logged by: D. Portsmouth
 Contract No. 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB017	
Client: AMEY OW Limited	Location: E:400119.337 N:513703.055		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 280.298	Start Date: 09/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1			279.90		(0.40)	TOPSOIL (Soft dark brown slightly organic clayey slightly sandy slightly gravelly silt with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone). at c.0.20m BGL ... silt is of high plasticity.	
0.20	J2					0.40	Soft orange mottled grey slightly sandy slightly gravelly CLAY/SILT with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and mudstone. at c.0.50m BGL ... clay/silt is of high plasticity.	
0.20-0.40	B3							
0.50	J4							
0.50-1.00	B5							
0.50	HSV	49 (25)kPa						
1.00	ES6					(1.60)		
1.00	HSV	51 (25)kPa						
1.20-1.65	B8							
1.20-1.65	SJ7	50/205mm						
2.00	SJ9	100/75mm		278.30		2.00	Terminated at 2.00m BGL - due to possible rockhead obstruction.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
09/02/2021	0.00	0.00	150		1.70 - 2.00	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
09/02/2021	2.00	1.80	150	Dry				
10/02/2021	2.00	1.80	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: J. Myall	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited		Location: E:400234.832 N:513712.738	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 271.411	Start Date: 12/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.70	ES1 J2 B3			271.01		0.40	MADE GROUND (Black sandy gravel. Sand is fine to coarse. Gravel is fine to coarse subangular and includes macadam, mudstone and limestone).	
0.70				270.81		0.60	MADE GROUND (Yellow grey brown gravel and cobbles. Gravel is fine to coarse angular and includes limestone and mudstone. Cobbles are angular to subrounded and includes limestone and mudstone).	
0.70-1.20				270.21	1.20		Grey clayey sandy GRAVEL with high cobble content. Gravel is medium to coarse subangular and includes mudstone and limestone. Cobbles are angular and include mudstone and limestone. <i>Boring complete at 1.20m BGL - continued by rotary drilling.</i>	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
12/02/2021	0.00				1.00 - 1.20	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.20m - water level rose to 0.72m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.
12/02/2021	1.20			0.72				

All dimensions in metres Scale 1:50.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D.P./R.C.

Contract No. **4322C**



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited		Location: E:400234.832 N:513712.738	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 271.411	Start Date: 12/02/2021
		Sheet: 1 of 7	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
								Discontinuity Detail	Main
1.20 (92mm)	50 (47) 47	NR		270.21		1.20	1.20-1.70m ... no recovery.	(1) LIMESTONE. (Driller notes possible boulder and describes as 'hard').	
				269.71		1.70	1.70-2.20m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open clean discontinuities.	Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered. (Possible Boulders).	
2.20 (92mm)	43 (43) 43	NR		269.21		2.20	2.20-2.60m ... no recovery.	(1) LIMESTONE. (Driller notes possible boulder and describes as 'hard').	
				268.81		2.60	2.60-2.90m ... subvertical (65-85 degrees) closely spaced undulating smooth and rough open infilled (clay) on joint surfaces discontinuities.	Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered. (Possible Boulders).	
2.90 (92mm)	71 (71) 71	NR		268.51		2.90	2.90-3.10m ... no recovery.	(1) LIMESTONE. (Driller notes boulders with possible clay bands).	
				268.31		3.10	3.10-3.60m ... subhorizontal (5-20 degrees) and subvertical (65-85 degrees) closely spaced planar undulating smooth and rough open clean and infilled (clay) on joint surfaces discontinuities.	2.90-5.10m ... driller notes loss of flush to 0% returns. Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered. (Possible Boulders).	
3.60 (92mm)	0 (0) 0	NR		267.81		3.60	3.60-4.10m ... no recovery.	(1) LIMESTONE. (Driller notes boulders with possible clay bands).	
				267.31		4.10	4.10-5.10m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open clean discontinuities.	Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered.	
5.10	100 (83) 83	NI					5.10-5.50m ... non-intact.	5.10-7.00m ... driller notes loss of	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
18/02/2021	1.20	1.20	Dry	4.10	C	50/0mm	1.20 - 2.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.20m - water level rose to 0.72m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.
18/02/2021	2.90	1.20	Dry				2.20 - 2.90	Air/Mist	100	
19/02/2021	2.90	1.20	Dry				2.90 - 3.60	Air/Mist	0	
							3.60 - 4.10	Air/Mist	0	
							4.10 - 5.10	Air/Mist	0	
							5.10 - 5.50	Air/Mist	50	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited		Location: E:400234.832 N:513712.738	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 271.411	Start Date: 12/02/2021
		Sheet: 2 of 7	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
							Discontinuity Detail	Main	
5.50	(0) 0							flush to 50% returns. Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered. (continued)	
7.00	100 (80) 71	5				(2.90)	5.50-5.70m ... subvertical (65-85 degrees) closely spaced undulating rough open clean discontinuities.		
		NI					5.70-6.10m ... non-intact.		
		6					6.10-7.00m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open clean discontinuities.		
7.50	40 (14) 0	NR				264.41	7.00-7.30m ... no recovery.	(1) LIMESTONE. 7.00-15.00m ... driller notes loss of flush to 0% returns.	
		NI				264.11	7.30-7.50m ... non-intact.	Medium strong to strong dark grey fossiliferous LIMESTONE partially weathered.	
8.00	93 (81) 81	3				(0.70)	7.50-8.90m ... subhorizontal (5-20 degrees) and subvertical (65-85 degrees) medium spaced planar undulating smooth and rough open clean and stained (orange oxidation) discontinuities.	Medium strong dark grey fossiliferous LIMESTONE partially weathered.	
						263.41	8.00		
9.00	60 (37) 37	NR				(0.90)	8.90-9.60m ... no recovery.	(1) LIMESTONE.	
						262.51	8.90		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
19/02/2021	7.00	4.10	Dry				5.50 - 7.00	Air/Mist	50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.20m - water level rose to 0.72m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.
22/02/2021	7.00	4.10	Dry				7.00 - 7.50	Air/Mist	0	
							7.50 - 9.00	Air/Mist	0	
							9.00 - 10.50	Air/Mist	0	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited		Location: E:400234.832 N:513712.738	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 271.411	Start Date: 12/02/2021
		Sheet: 3 of 7	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
							Discontinuity Detail	Main	
10.50		NI		261.81		(0.70)		(1) LIMESTONE. (continued)	
						9.60	9.60-9.80m ... non-intact.	Medium strong dark grey fossiliferous LIMESTONE partially weathered.	
						(1.00)	9.80-10.05m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open clean discontinuities.		
							10.05-10.15m ... non-intact.		
10.50	100 (96) 85	5		260.81		10.60	10.15-10.50m ... subhorizontal (5-20 degrees) and subvertical (65-85 degrees) closely spaced planar undulating smooth and rough open stained (orange oxidation) and clean.	Moderately weak to medium strong grey fine to medium grained SANDSTONE partially weathered.	
						(0.80)	10.50-12.00m ... subhorizontal (5-20 degrees) medium spaced planar smooth and rough open stained (orange oxidation) and clean discontinuities.		
12.00	100 (81) 45	NI		260.01		11.40	12.00-12.30m ... non-intact.	Moderately weak to medium strong dark grey interbedded MUDSTONE, SILTSTONE and fine to medium grained SANDSTONE partially weathered.	
						(3.30)	12.30-13.50m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open stained (orange oxidation) and clean discontinuities.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							10.50 - 12.00	Air/Mist	0	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.20m - water level rose to 0.72m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.
							12.00 - 13.50	Air/Mist	0	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets	Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited		Location: E:400234.832 N:513712.738	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 271.411	Start Date: 12/02/2021
		Sheet: 4 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
13.50	100 (89) 30	NI							
(92mm)		11				13.50-13.85m ... non-intact.		Moderately weak to medium strong dark grey interbedded MUDSTONE, SILTSTONE and fine to medium grained SANDSTONE partially weathered. (continued)	
						13.85-15.00m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open stained (orange oxidation) and clean.			
				256.71	14.70	14.60-14.70m ... 1No. subvertical (65-85 degrees) undulating smooth rough open clean stained (orange oxidation) discontinuity.		Medium strong to strong dark grey interbedded MUDSTONE, SILTSTONE and fine to medium grained SANDSTONE partially weathered.	
				256.41	x x x	15.00		Complete at 15.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
22/02/2021	15.00	4.10	Dry				13.50 - 15.00	Air/Mist	0	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.20m - water level rose to 0.72m BGL (20mins). (4) 19mm diameter standpipe piezometer installed to 4.50m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

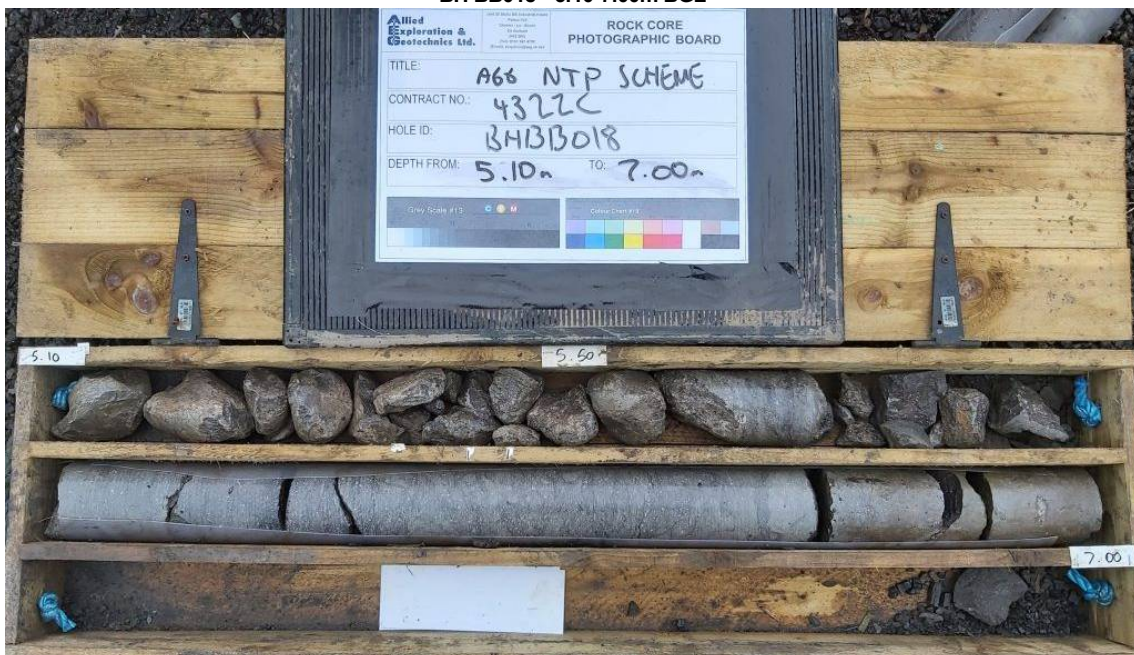
Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB018
Client: AMEY OW Limited	Location: E:400234.832 N:513712.738		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 271.411	Start Date: 12/02/2021	Sheet: 5 of 7

Figure BH BB018.1
BH BB018 - 1.20-5.10m BGL



Figure BH BB018.2
BH BB018 - 5.10-7.00m BGL





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DRILLHOLE RECORD

Status:-
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Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB018	
Client: AMEY OW Limited	Location: E:400234.832 N:513712.738		Sheet: 6 of 7
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 271.411	Start Date: 12/02/2021	

Figure BH BB018.3
BH BB018 - 7.00-10.50m BGL

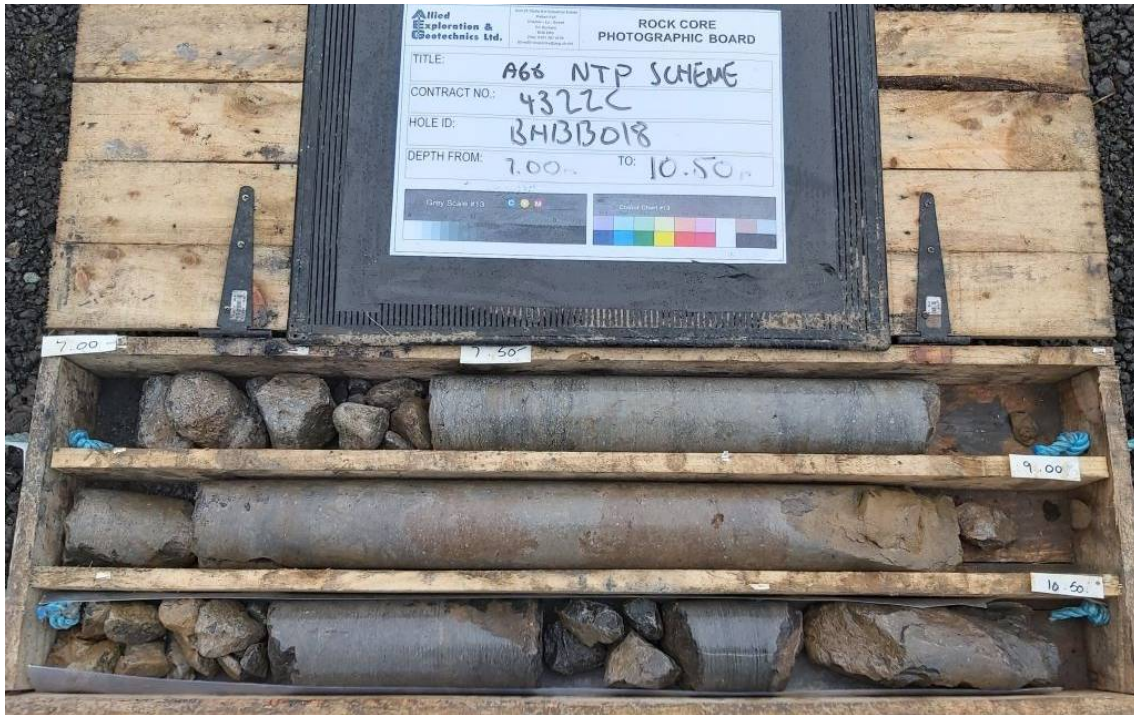


Figure BH BB018.4
BH BB018 - 10.50-13.50m BGL





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DRILLHOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB018
Client: AMEY OW Limited	Location: E:400234.832 N:513712.738		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 271.411	Start Date: 12/02/2021	Sheet: 7 of 7

Figure BH BB018.5
BH BB018 - 13.50-15.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB019	
Client: AMEY OW Limited	Location: E:400291.553 N:513701.160		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 270.265	Start Date: 10/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1			269.97		0.30	TOPSOIL (Dark brown very silty very gravelly sand with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone). at c.0.20m BGL ... silt fines are of very high plasticity.	
0.20	J2						Soft orange mottled grey slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and mudstone. at c.1.00m BGL ... clay is of intermediate plasticity.	
0.20-0.40	B3							
0.50	J4							
0.50	HSV	45 (24)kPa						
1.00	ES5							
1.00	J6					(2.50)		
1.00	HSV	47 (25)kPa						
1.20-1.65	B8							
1.20-1.65	SJ7	N10						
2.00	U*9	(100)						
2.50-2.95	SJ10	100/30mm		267.47		2.80		
				267.27		3.00	(1) OBSTRUCTION (Possible Rockhead). Terminated at 3.00m BGL - due to obstruction (possible rockhead).	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
10/02/2021	0.00	0.00	150		2.80 - 3.00	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
10/02/2021	3.00	2.80	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB020	
Client: AMEY OW Limited		Location: E:400391.128 N:513676.450	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 266.991	Start Date: 11/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20 0.20 0.20-0.70 0.60	ES1 J2 B3 HSV	27 (17)kPa		266.29		0.70	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
1.00 1.00 1.20-1.65 1.20-1.65	ES4 J5 B7 SJ6	N10		265.29		1.70	Soft to firm brown yellow slightly organic slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone. at c.1.00m BGL ... clay is of low plasticity.	
2.00-2.45	U8	(80)		264.69		2.30	Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone.	
2.45	J9							
3.00-3.45 3.00-3.45	B11 SJ10	N29		263.29		3.70	Firm to stiff grey brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. at c.2.45m BGL ... clay is of low plasticity.	
4.00-4.45 4.00-4.45	B13 SJ12	N44				1.80		
5.00-5.45 5.00-5.45	J14 B15			261.49		5.50	Firm to stiff grey very gravelly CLAY/clayey GRAVEL with medium to high cobble content. Sand is fine to medium. Gravel is fine to coarse subangular and includes mudstone. Cobbles are angular and include mudstone.	
Boring complete at 5.50m BGL - continued by rotary drilling.								

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
11/02/2021	0.00	0.00	150		4.20 - 4.50	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
11/02/2021	4.50	4.30	150	Dry	4.70 - 5.00	1:00		
12/02/2021	4.50	4.30	150	0.52				
12/02/2021	5.50	4.80	150	1.06				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB020	
Client: AMEY OW Limited		Location: E:400391.128 N:513676.450	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 266.991	Start Date: 11/02/2021
		Sheet: 1 of 5	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
5.50 (92mm)	100 (80) 0	25		261.49		5.50	5.50-6.10m ... subhorizontal (5-20 degrees) very closely spaced planar smooth and rough open and closed infilled (clay) discontinuities.	Weak to moderately weak dark grey MUDSTONE partially weathered.	
6.00	93 (40) 0	NI				6.10-6.50m ... non-intact.			
		21				6.50-7.50m ... subhorizontal (5-20 degrees) very closely spaced planar smooth and rough open and closed infilled (clay) discontinuities.			
7.50	78 (23) 7	NR				7.30-7.50m ... 1No. vertical (90 degrees) planar to undulating rough partly open discontinuity. 7.40-7.50m ... 1No. subvertical (75-85 degrees) planar to undulating smooth and rough open infilled (clay) discontinuity. 7.50-7.85m ... no recovery.			
		NI				7.85-8.25m ... non-intact.			
		9				8.00-8.10m ... 1No. subvertical (75-85 degrees) planar rough closed infilled (clay) discontinuity.			
9.00	100 (97) 13	17				8.25-9.00m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open and infilled (clay) discontinuities.			
						9.00-10.50m ... subhorizontal (5-20 degrees) and subvertical (75-85 degrees) very closely spaced planar to undulating smooth and rough open and closed infilled (clay) discontinuities.			

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
26/02/2021	5.50	5.50	0.20				5.50 - 6.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
							6.00 - 7.50	Air/Mist	100	
							7.50 - 9.00	Air/Mist	100	
							9.00 - 10.50	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB020	
Client: AMEY OW Limited		Location: E:400391.128 N:513676.450	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 266.991	Start Date: 11/02/2021
		Sheet: 2 of 5	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
10.50	(92mm)							Weak to moderately weak dark grey MUDSTONE partially weathered. (continued)	
						10.50-10.60m ... non-intact.			
						10.60-11.50m ... subhorizontal (5-20 degrees) closely spaced planar to undulating smooth and rough open and closed infilled (clay) discontinuities.			
						11.10-11.30m ... 1No. subvertical (75-85 degrees) undulating smooth closed infilled (clay) discontinuity.			
						11.50-12.00m ... non-intact.			
12.00	(92mm)			254.99		12.00		(1) Black MUDSTONE with soft bands. (Driller describes as 'badly broken').	
						12.00-12.40m ... no recovery.			
						(0.40)			
						12.40-13.50m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open and closed infilled (clay) discontinuities.		Weak to moderately weak dark grey MUDSTONE partially weathered.	
13.50	(92mm)			254.59					

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							10.50 - 12.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
							12.00 - 13.50	Air/Mist	100	
							13.50 - 15.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB020	
Client: AMEY OW Limited		Location: E:400391.128 N:513676.450	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 266.991	Start Date: 11/02/2021
			Sheet: 3 of 5

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
(92mm)	100 (87) 0	NI					13.50-13.70m ... non-intact.	Weak to moderately weak dark grey MUDSTONE partially weathered. (continued)	
		11				(2.60)	13.70-13.95m ... 1No. subvertical (75-85 degrees) undulating rough closed and infilled (clay) discontinuity. 13.70-14.50m ... subhorizontal (5-20 degrees) closely spaced planar to undulating smooth and rough open infilled (clay) discontinuities.		
		NI					14.50-14.65m ... non-intact.		
		17					14.65-15.00m ... subhorizontal (5-20 degrees) closely spaced planar smooth and rough open and closed infilled (clay) discontinuities.		
				251.99		15.00		Complete at 15.00m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
26/02/2021	15.00	5.50	11.40							(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB020
Client: AMEY OW Limited	Location: E:400391.128 N:513676.450		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 266.991	Start Date: 11/02/2021	Sheet: 4 of 5

Figure BH BB020.1
BH BB020 - 5.50-7.50m BGL



Figure BH BB020.2
BH BB020 - 7.50-10.50m BGL





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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB020	
Client: AMEY OW Limited	Location: E:400391.128 N:513676.450		Sheet: 5 of 5
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 266.991	Start Date: 11/02/2021	

Figure BH BB020.3
BH BB020 - 10.50-13.50m BGL



Figure BH BB020.4
BH BB020 - 13.50-15.00m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB021	
Client: AMEY OW Limited		Location: E:400525.525 N:513630.605	
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 264.427	Start Date: 11/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1	27 (17)kPa	↓	264.13		0.30	Friable brown sandy slightly gravelly CLAY with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
0.20	J2							
0.20-0.30	B3							
0.50	J4							
0.60	HSV			(1.10)		Soft to firm brown yellow slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone. at c.0.50m BGL ... clay/silt of high plasticity. at c.1.00m BGL ... clay is of intermediate to high plasticity.		
1.00	ES5	(50)	↓	263.03		1.40	Medium dense brown very clayey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to medium subangular and includes limestone and mudstone.	
1.00	J6							
1.00-1.20	B7							
1.20-1.65	U8	N20	↓	261.63		(1.40)		
1.65	J9							
2.00-2.45	B11	N20	↓	261.63		(1.40)		
2.00-2.45	SJ10							
3.00-3.45	U12	(100)	↓	260.73		(0.90)	Firm grey brown slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. at c.3.00m BGL ... very low strength.	
3.45	J13							
4.00-4.45	B15	N32	↓	258.93		(1.80)	Firm to stiff grey slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and includes limestone and mudstone. (Driller notes gravel bands).	
4.00-4.45	SJ14							
5.00-5.45	B17	50/280mm	↓	258.93			Complete at 5.50m BGL.	
5.00	SJ16							

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
11/02/2021	0.00	0.00	150					(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 1.65m - water level rose to 0.52m BGL (20mins).
11/02/2021	5.50	4.50	150	0.52				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets	by:	Logged by: D. Portsmouth	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB022	
Client: AMEY OW Limited		Location: E:400853.036 N:513520.758	
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m): 262.349	Start Date: 19/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1			262.05		0.30	Brown very clayey slightly gravelly SAND with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse.	
0.50 0.60 0.70	HSV B2 J3	38 (20)kPa				(1.70)	Firm grey mottled orange slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone. at c.0.70m BGL ... clay is of intermediate plasticity.	
1.20	ES4						at c.1.50m BGL ... low strength. Clay is of low plasticity.	
1.50-1.95	U5	(30)						
2.00	J6			260.35		2.00	Firm to stiff brown becoming grey slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles are rounded and include limestone and mudstone.	
2.20	ES7					(1.00)	at c.2.40m BGL ... clay is of low plasticity.	
2.40 2.50-3.00 2.50-2.95	B8 B10 SJ9	32/156mm		259.35		3.00	Terminated at 3.00m BGL - due to an obstruction.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
19/02/2021	0.00	0.00	150		2.80 - 3.00	1:00	1.20 - 3.00	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 3.00m BGL.
19/02/2021	3.00	3.00	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB023	
Client: AMEY OW Limited		Location: E:400909.178 N:513595.501	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 265.463	Start Date: 11/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20 0.20 0.20-0.40 0.60	ES1 J2 B3 HSV	28 (18)kPa		265.06		(0.40) 0.40	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
1.00 1.00 1.00-1.20 1.20-1.65 1.20-1.65 1.20	ES4 J5 B6 J7 B8	N18		264.16		(0.90) 1.30	Soft to firm brown/yellow slightly organic sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone. at c.1.00m BGL ... clay is of intermediate plasticity.	
2.00	U*9	(100)		263.76		(0.40) 1.70	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with medium cobble and boulder content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles/boulders are rounded and include limestone and mudstone.	
2.50-2.95 2.50-2.95 2.50	J10 B11	N42					Firm to stiff grey slightly sandy slightly gravelly CLAY with medium cobble cobble and boulder content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone. Cobbles and boulders are rounded and include limestone and mudstone. at c.2.50m BGL ... clay is of low plasticity.	
3.50-3.95 3.50-3.95 3.50	J12 B13	N40				(3.40)		
4.50	U*14	(100)						
5.00 5.00	J15	100/30mm		260.36		5.10	Boring complete at 5.10m BGL - continued by rotary drilling.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
15/02/2021	0.00	0.00	150		2.30 - 2.50	0:30		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 6.00m BGL.
15/02/2021	5.10	4.80	150	Damp	4.70 - 5.00	1:00		

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB023	
Client: AMEY OW Limited		Location: E:400909.178 N:513595.501	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 265.463	Start Date: 11/02/2021
			Sheet: 1 of 5

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
5.10 (92mm)	60 (0) 0			260.36		5.10	5.10-5.50m ... no recovery. 5.50-6.10m ... soil.	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with high cobble/boulder content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. Cobbles/boulders are subrounded and include limestone and sandstone.	
6.10 (92mm)	22 (22) 11	NR					6.10-6.80m ... no recovery. 6.80-7.00m ... soil.		
7.00 (92mm)	0 (0) 0	NR					7.00-9.00m ... no recovery.		
8.00 (92mm)	0 (0) 0								
8.50 (92mm)	29 (29) 14						9.00-9.20m ... soil.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
23/02/2021	5.10	4.80		6.10	C	N53	5.10 - 6.10	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 6.00m BGL.
				7.00	C	61/122mm	6.10 - 7.00	Air/Mist	100	
				8.00	C	N71	7.00 - 8.00	Air/Mist	100	
							8.00 - 8.50	Air/Mist	100	
							8.50 - 9.20	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
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Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB023	
Client: AMEY OW Limited		Location: E:400909.178 N:513595.501	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 265.463	Start Date: 11/02/2021
		Sheet: 2 of 5	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
9.20	0 (0) 0	NR				9.20-12.00m ... no recovery.	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with high cobble/boulder content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. Cobbles/boulders are subrounded and include limestone and sandstone. (continued)		
10.20	0 (0) 0					(11.90)			
11.20	20 (20) 20					12.00-12.60m ... soil.			
12.20	40 (0) 0	SOIL				12.60-13.90m ... no recovery.			

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
23/02/2021	9.20	8.30	7.41	9.20	C	N52	9.20 - 10.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 6.00m BGL.
24/02/2021	9.20	8.50	9.41	10.20	C	N41	10.20 - 11.20	Air/Mist	100	
				11.20	C	N37	11.20 - 12.20	Air/Mist	100	
				12.20	C	50/47mm	12.20 - 13.20	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

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Client: AMEY OW Limited		Location: E:400909.178 N:513595.501	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 265.463	Start Date: 11/02/2021
		Sheet: 3 of 5	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
13.20	30 (10) 0 (92mm)							Firm to stiff grey brown slightly sandy slightly gravelly CLAY with high cobble/boulder content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. Cobbles/boulders are subrounded and include limestone and sandstone. (continued)	
							13.90-14.50m ... soil.		
14.20	30 (10) 10 (92mm)	NR						14.50-15.60m ... no recovery.	
15.20	50 (0) 0 (92mm)	SOIL						15.60-16.70m ... soil.	
16.00	70 (0) 0 (92mm)	NR						16.70-17.00m ... no recovery.	
17.00	100	7		248.46		17.00		17.00-17.60m ... subhorizontal (10-15 degrees) and	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
				13.20	C	77/191mm	13.20 - 14.20	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 6.00m BGL.
				14.20	C	N45	14.20 - 15.20	Air/Mist	100	
				15.20	C	N35	15.20 - 16.00	Air/Mist	100	
				16.00	C	N51	16.00 - 17.00	Air/Mist	100	
							17.00 - 17.60	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB023	
Client: AMEY OW Limited		Location: E:400909.178 N:513595.501	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 265.463	Start Date: 11/02/2021
			Sheet: 4 of 5

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
(92mm)	(100) 67			247.86		(0.60) 17.60	subvertical (80 degrees) closely spaced planar rough undulating smooth and rough open clean discontinuities.	Medium strong to strong grey LIMESTONE unweathered. (continued)	
								Complete at 17.60m BGL.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
24/02/2021	17.60	9.70	10.09							(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 6.00m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project:	A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB023			
Client:	AMEY OW Limited	Location:	E:400909.178 N:513595.501				
Method (Equipment):	Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m):	265.463	Start Date:	11/02/2021	Sheet:	5 of 5

Figure BH BB023.1
BH BB023 - 5.10-15.20m BGL



Figure BH BB023.2
BH BB023 - 15.20-17.60m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited		Location: E:400903.112 N:513558.935	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 264.105	Start Date: 23/02/2021
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1	37 (21)kPa		263.81		0.30	Brown very clayey slightly gravelly SAND with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse.	
0.40	B2					(1.80)	Firm grey mottled orange mottled slightly sandy gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone. Cobbles are subangular to subrounded and include limestone. at c.0.70m BGL ... clay is of low to intermediate plasticity.	
0.60	HSV							
0.70	J3							
1.20	ES4	(100)		262.01		2.10	at c.2.00m BGL ... clay is of intermediate plasticity.	
1.50-2.00	U*B5							
2.00	J6	50/0mm		261.60		2.50	Firm to stiff grey brown slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to coarse subangular and includes mudstone and limestone. Cobbles are subrounded and include limestone. Boring complete at 2.50m BGL - continued by rotary drilling.	
2.20	B7							
2.50	SJ8							

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
23/02/2021	0.00	0.00	150		2.30 - 2.50	1:00	1.20 - 2.30	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
23/02/2021	2.50	2.50	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited		Location: E:400903.112 N:513558.935	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 264.105	Start Date: 23/02/2021
		Sheet: 1 of 7	

RUN DETAILS			STRATA					Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
2.50 (92mm)	0 (0) 0	SOIL		261.60		2.50	2.50-13.00m ... soil	Stiff grey brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes mudstone and limestone. Cobbles are subrounded and include limestone.	
3.00 (92mm)	60 (0) 0								
4.00 (92mm)	80 (0) 0								
4.50 (92mm)	0 (0) 0								
5.00 (92mm)	100 (0) 0								
6.00 (92mm)	30 (0) 0								

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
25/02/2021	2.50	2.50	Dry	3.00	C	61/122mm	2.50 - 3.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
				4.00	C	N28	3.00 - 4.00	Air/Mist	100	
				5.00	C	N38	4.00 - 4.50	Air/Mist	100	
				4.50	C	N29	4.50 - 5.00	Air/Mist	100	
				5.00	C		5.00 - 6.00	Air/Mist	100	
				6.00	C		6.00 - 7.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited		Location: E:400903.112 N:513558.935	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 264.105	Start Date: 23/02/2021
		Sheet: 2 of 7	

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
7.00	20 (0) 0							Stiff grey brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes mudstone and limestone. Cobbles are subrounded and include limestone. (continued)	
8.00	35 (0) 0					(10.50)			
9.00	20 (0) 0								
10.00	50 (0) 0								

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
				7.00	C	N38	7.00 - 8.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
				8.00	C	N25	8.00 - 9.00	Air/Mist	100	
				9.00	C	N50	9.00 - 10.00	Air/Mist	100	
				10.00	C	N37	10.00 - 11.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited		Location: E:400903.112 N:513558.935	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 264.105	Start Date: 23/02/2021
		Sheet: 3 of 7	

RUN DETAILS				STRATA					Instrument/ Backfill
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail	Main	
11.00	50 (0) 0							Stiff grey brown slightly sandy slightly gravelly CLAY with medium to high cobble content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded and includes mudstone and limestone. Cobbles are subrounded and include limestone. (continued)	
12.00	30 (0) 0								
13.00	93 (93) 80	NR 3		251.11		13.00	13.00-13.10m ... no recovery. 13.10-14.50m ... subhorizontal (5-25 degrees) widely spaced planar undulating smooth and rough open infilled (clay) and stained (orange oxidation) discontinuities.	Medium strong to strong grey fossiliferous LIMESTONE partially weathered.	
14.50									

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
25/02/2021	11.00	7.00	8.11	11.00	C	50/47mm	11.00 - 12.00	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
26/02/2021	11.00	7.00	7.69	12.00	C	50/40mm	12.00 - 13.00	Air/Mist	100	
				13.00	C	50/17mm	13.00 - 14.50	Air/Mist	100	
							14.50 - 16.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited		Location: E:400903.112 N:513558.935	
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)		Ground Level (m): 264.105	Start Date: 23/02/2021
		Sheet: 4 of 7	

RUN DETAILS			STRATA				Instrument/ Backfill		
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)		Description	
								Discontinuity Detail	Main
16.00	100 (100) 77	4		248.11		(3.00)	14.50-16.00m ... subhorizontal (5-25 degrees) medium spaced planar undulating smooth and rough open infilled (clay) and stained (orange oxidation) discontinuities.	Medium strong to strong grey fossiliferous LIMESTONE partially weathered. (continued)	
16.00	33 (30) 21	NR		247.11		(1.00)	16.00-17.00m ... no recovery.	(1) LIMESTONE.	
17.50	75 (70) 46	6		245.61		(1.50)	17.00-17.30m ... subhorizontal (5-25 degrees) closely spaced stepped rough open clean discontinuities. 17.30-17.50m ... non-intact. 17.50-20.30m ... subhorizontal (5-25 degrees) closely spaced planar to undulating rough open clean discontinuities.	Medium strong to strong grey fossiliferous LIMESTONE partially weathered.	

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
							16.00 - 17.50	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
							17.50 - 19.00	Air/Mist	100	

All dimensions in metres Scale 1:25.00

For explanation of symbols and abbreviations see Key Sheets

Logged by: D.P./R.C.

Contract No. 4322C



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DRILLHOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. BH BB024
Client: AMEY OW Limited	Location: E:400903.112 N:513558.935		
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 264.105	Start Date: 23/02/2021	Sheet: 5 of 7

RUN DETAILS				STRATA				Instrument/ Backfill	
Depth & (Core Ø)	TCR (SCR) RQD	Fracture Index	Water	Reduced Level	Legend	Depth (Thickness)	Description		
							Discontinuity Detail		Main
19.50 (92mm)	100 (100) 75			243.81	[Dotted Legend]	(1.80) 20.30	Medium strong yellow brown fine to medium grained SANDSTONE partially weathered. (continued)	[Patterned Backfill]	
							Complete at 20.30m BGL.		

Drilling Progress and Water Observations				Standard Penetration Test			Flush			General Remarks
Date	Depth	Casing	Water Standing	Depth	Type	Result	From - To	Type	Returns (%)	
26/02/2021	20.30	7.00	14.11				19.00 - 20.30	Air/Mist	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.

All dimensions in metres Scale 1:25.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D.P./R.C.	Contract No. 4322C
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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited	Location: E:400903.112 N:513558.935		Sheet: 6 of 7
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 264.105	Start Date: 23/02/2021	

Figure BH BB024.1
BH BB024 - 2.50-10.00m BGL



Figure BH BB024.2
BH BB024 - 10.00-14.50m BGL





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DRILLHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB024	
Client: AMEY OW Limited	Location: E:400903.112 N:513558.935		Sheet: 7 of 7
Method (Equipment): Percussion/Coring (Dando 2000/Comacchio GEO 205)	Ground Level (m): 264.105	Start Date: 23/02/2021	

Figure BH BB024.3
BH BB024 - 14.50-19.00m BGL



Figure BH BB024.4
BH BB024 - 19.00-20.30m BGL





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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB025	
Client: AMEY OW Limited	Location: E:400982.970 N:513559.178		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 262.943	Start Date: 22/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	ES1			262.64		0.30	Brown very clayey slightly gravelly SAND with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse.	
0.50 0.60 0.70	HSV B2 J3	37 (21)kPa				(2.20)	Firm grey mottled orange slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and sandstone. Cobbles are subangular to subrounded and include limestone.	
1.20 1.20-1.65	ES4 U5	(40)					at c.0.70m BGL ... clay is of intermediate plasticity. at c.1.20m BGL ... low strength. Clay is of intermediate plasticity.	
2.00 2.20 2.40 2.50	J6 B7 J8 SJ9	50/21mm		260.44		2.50	Terminated at 2.50m BGL - due to an obstruction.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
22/02/2021	0.00	0.00	150		2.40 - 2.50	1:00	1.20 - 2.50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.00m BGL.
22/02/2021	2.50	2.50	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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BOREHOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. BH BB026	
Client: AMEY OW Limited	Location: E:400993.570 N:513655.322		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m): 267.175	Start Date: 16/02/2021	Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.00-0.30	B3						Friable brown sandy slightly gravelly CLAY/SILT with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
0.20	ES1			266.88		0.30		
0.20	J2							
0.60	HSV	35 (20)kPa				(1.00)	Firm brown yellow slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to medium subangular and includes sandstone and mudstone.	
1.00	ES4						at c.1.00m BGL ... clay is of intermediate to high plasticity.	
1.00	J5			265.88		1.30		
1.00-1.20	B6						Firm to stiff grey brown slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to medium. Gravel is fine to medium subangular and includes mudstone and limestone.	
1.20-1.65	J7						Cobbles are rounded and include limestone and mudstone. (Driller notes boulders).	
1.20-1.65	B8	N41				(1.70)		
2.00	U*9	(50)						
2.50	U*10	(50)						
3.00	11			264.18		3.00	at c.3.00m BGL ... (1) Obstruction.	
3.00		100/25mm					Terminated at 3.00m BGL - due to an obstruction.	

Boring Progress and Water Observations					Chiselling		Water Added	General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Duration (hh:mm)	From - To	
16/02/2021	0.00	0.00	150		2.60 - 3.00	1:00		(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
16/02/2021	3.00	2.80	150	Dry				

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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Window/Windowless Sample Hole Records





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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. WS BB001	
Client: AMEY OW Limited		Location: E:401153.036 N:513677.686	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 265.505	Start Date: 05/02/2021
		Sheet: 1 of 2	

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1					(0.50)	Brown very clayey slightly gravelly SAND with many rootlets. Sand is fine to coarse. Gravel is fine to medium subangular and includes sandstone and mudstone.	
0.20	ES2			265.01		0.50		
0.30	B3						Firm to stiff grey slightly sandy slightly gravelly CLAY with medium cobble/boulder content. Sand is fine to medium. Gravel is fine to medium subangular and include mudstone and limestone. Cobbles/boulders are assumed to be rounded and include limestone and mudstone. at c.1.20m BGL ... clay is of low plasticity.	
0.40	B4							
0.80	ES5							
1.00	B6							
1.20-2.20	U8	(96)				(1.90)		
1.20-1.65	SJ7	N21						
1.30	J10							
1.40	ES11							
1.80	B12							
2.20	SJ9	50/41mm		263.11		2.40		
Terminated at 2.40m BGL - due to an obstruction.								

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
08/02/2021	0.00				1.20 - 2.20	101	100	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
08/02/2021	2.40			2.31					

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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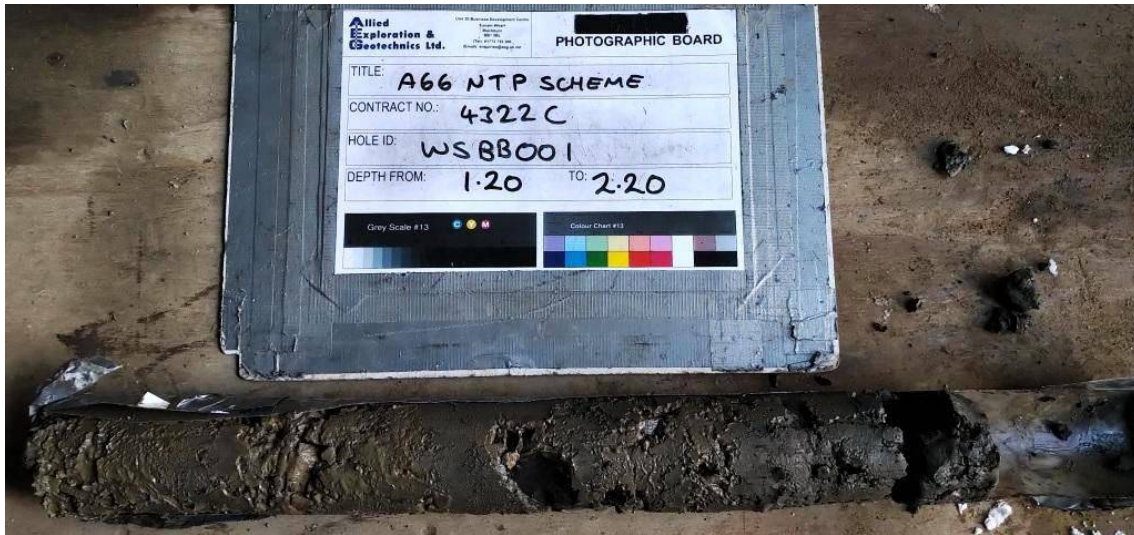
WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. WS BB001
Client: AMEY OW Limited	Location: E:401153.036 N:513677.686		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m): 265.505	Start Date: 05/02/2021	Sheet: 2 of 2

Figure WS BB001.1
WS BB001 - 1.20-2.20m BGL





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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. WS BB002	
Client: AMEY OW Limited		Location: E:398646.658 N:513490.231	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m): 284.986	Start Date: 22/02/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA				Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		Description
0.20	ES1			284.79		0.20	MADE GROUND (Topsoil).	
0.20	J2						MADE GROUND (Dark brown very clayey very sandy gravel with cobbles noted and root/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and coal. Cobbles are subangular to subrounded and include sandstone).	
0.50-1.00	B3					(1.00)	at c.0.20m BGL ... clay is of intermediate plasticity.	
1.00	ES4			283.79		1.20	Soft dark brown slightly sandy slightly gravelly CLAY with cobbles noted and root/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.	
1.00	J5					(0.40)	at c.1.20m BGL ... clay is of intermediate plasticity.	
1.00-1.20	B6						Soft dark grey brown mottling orange slightly sandy slightly gravelly CLAY with cobbles noted and roots/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.	
1.20-2.20	U9	(40)		283.39		1.60	at c.2.20m BGL ... clay is of intermediate plasticity.	
1.20-1.65	SJ7	N9				(1.60)	Soft dark brown slightly sandy slightly gravelly CLAY with cobbles noted and roots/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.	
1.50	ES8						at c.1.20m BGL ... clay is of intermediate plasticity.	
2.20-3.20	U12	(45)		281.79		3.20	Soft dark grey brown mottling orange slightly sandy slightly gravelly CLAY with cobbles noted and roots/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.	
2.20-2.65	SJ10	N10				(1.10)	Soft dark brown slightly sandy slightly gravelly CLAY with cobbles noted and roots/rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles are subangular to subrounded and include sandstone.	
2.50	ES11						Weak dark grey MUDSTONE.	
3.20-4.20	U14	(45)		280.69		4.30	Terminated at 5.20m BGL - due to possible bedrock.	
3.20-3.65	SJ13	N7				(0.50)		
4.20-5.20	U16	(100)		280.19		4.80		
4.50		N8		279.79		(0.40)		
5.20	SJ17	110/145mm				5.20		

Boring Progress and Water Observations					Liner Sample Information				General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Standing	From - To	Internal Dia (mm)	Recovery (%)	Subsampled	
22/02/2021	0.00			Dry	1.20 - 2.20	87	80	No	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 19mm diameter standpipe piezometer installed to 2.50m BGL.
22/02/2021	5.20				2.20 - 3.20	87	70	No	
					3.20 - 4.20	77	70	No	
					4.20 - 5.20	77	60	No	

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. WS BB002	
Client: AMEY OW Limited	Location: E:398646.658 N:513490.231		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m): 284.986	Start Date: 22/02/2021	Sheet: 2 of 3

Figure WS BB002.1
WS BB002 - 1.20-2.20m BGL

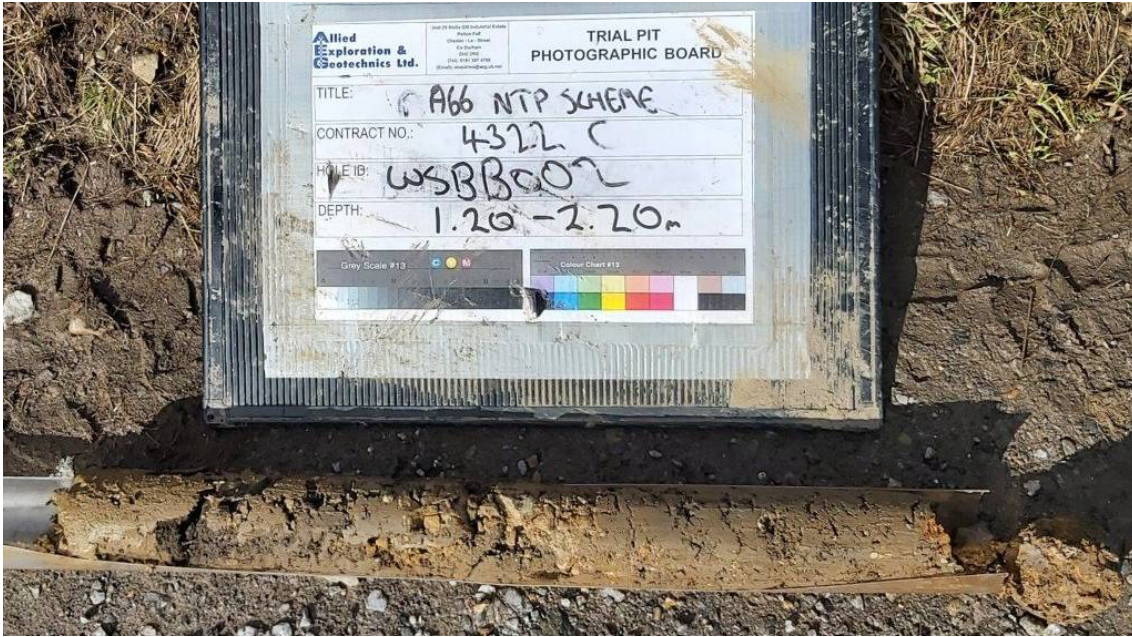
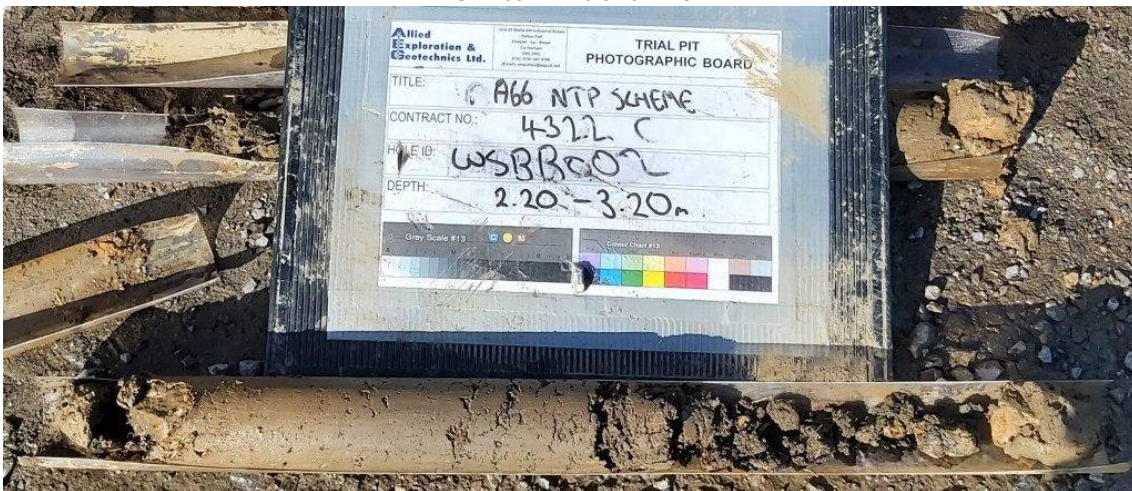


Figure WS BB002.2
WS BB002 - 2.20-3.20m BGL





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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. WS BB002	
Client: AMEY OW Limited	Location: E:398646.658 N:513490.231		Sheet: 3 of 3
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m): 284.986	Start Date: 22/02/2021	

Figure WS BB002.3
WS BB002 - 3.20-4.20m BGL

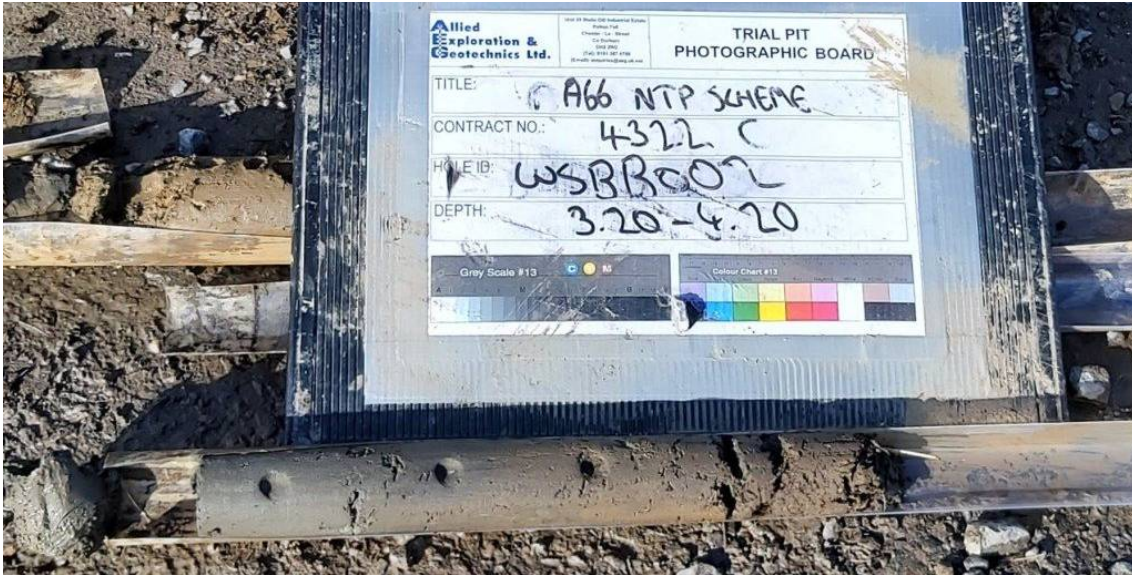
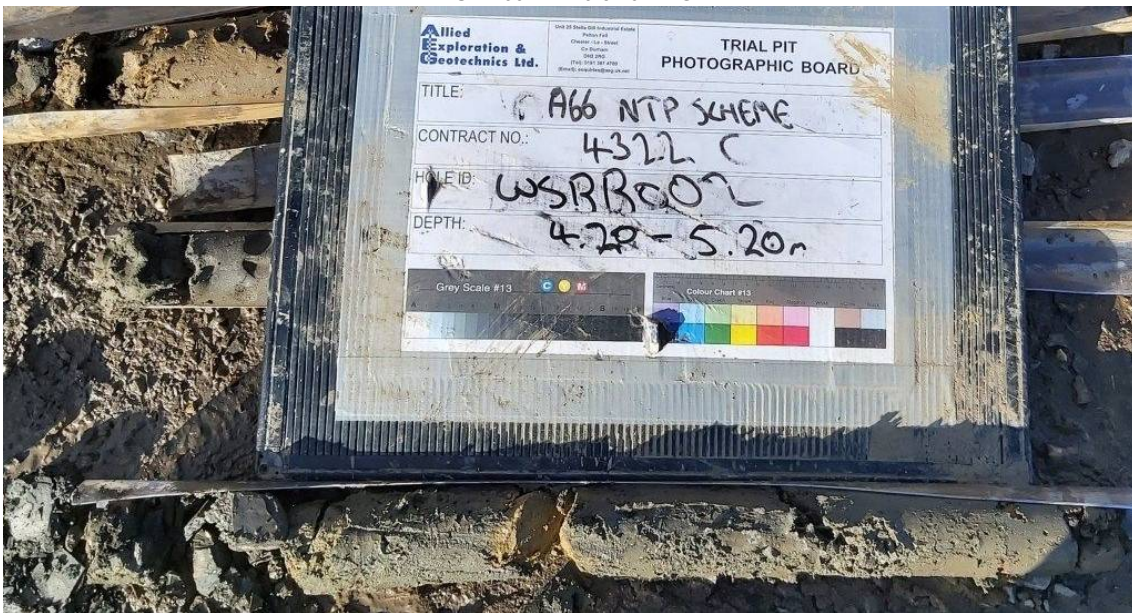


Figure WS BB002.4
WS BB002 - 4.20-5.20m BGL



Trial Pit Records





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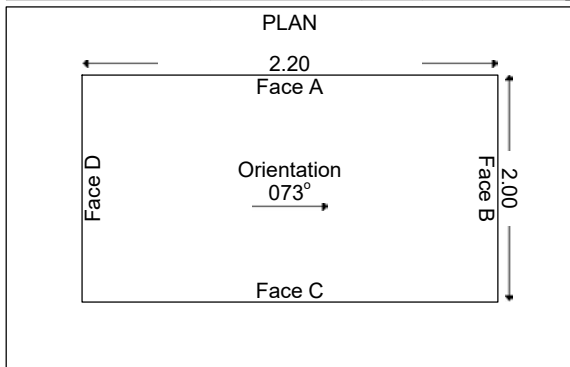
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB001
Client: AMEY OW Limited	Location: E:399259.009 N:513732.759	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.961	Start Date: 01/02/2021
		Sheet: 1 of 5

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10 0.20 0.30 0.40 0.40 0.50	J1 ES2 J3 B4 HSV ES5	40 (20)kPa		289.66		0.30	MADE GROUND (Topsoil comprising soft dark brown sandy slightly gravelly clay with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, brick and limestone).		
1.00	J6								Dark grey mottled orange brown very clayey very gravelly SAND and sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular and includes mudstone, sandstone and limestone. Cobbles are subrounded to subangular and include sandstone and mudstone.
1.50	B7							(2.80)	at c.0.90m BGL ... becoming grey mottled orange brown. at c.1.00m BGL ... clay is of intermediate plasticity.
2.00 2.10	ES8 J9								
2.50	B10								at c.2.50m BGL ... very clayey sandy gravel with low cobble content.
3.10	J11					286.86		3.10	Terminated at 3.10m BGL - repeated collapse of long faces.



GROUNDWATER
 Groundwater seepage inflow at 1.70m BGL (Slight inflow).

STABILITY
 Pit sides and base unstable throughout excavation. Repeated Collapse and re-excavation of Face A and Face C from 0.70m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Plate Load testing undertaken at 0.40m BGL.
 (2) Unsuitable for HSV testing below 0.50m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
---	---	--	------------------------	------------------------------



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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399259.009 N:513732.759		TP BB001
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.961	Start Date: 01/02/2021	Sheet: 2 of 5

Figure TP BB001.1
TP BB001



Figure TP BB001.2
TP BB001





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399259.009 N:513732.759	TP BB001	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.961	Start Date: 01/02/2021	Sheet: 3 of 5

Figure TP BB001.3
TP BB001



Figure TP BB001.4
TP BB001





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399259.009 N:513732.759		TP BB001
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.961	Start Date: 01/02/2021	Sheet: 4 of 5

Figure TP BB001.5
TP BB001



Figure TP BB001.6
TP BB001





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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB001
Client: AMEY OW Limited	Location: E:399259.009 N:513732.759		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.961	Start Date: 01/02/2021	Sheet: 5 of 5

Figure TP BB001.7
TP BB001





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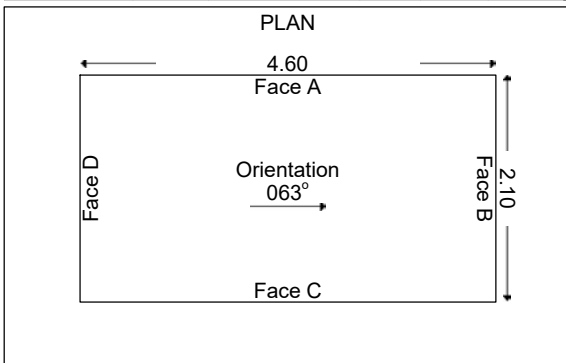
TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB002	
Client: AMEY OW Limited		Location: E:399323.080 N:513794.843	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 291.049	Start Date: 02/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			Water	STRATA			
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20 0.40 0.45 0.50 0.75	J1 ES2 ES3 HSV J4 B5	38 (20)kPa	290.70		0.35	TOPSOIL (Soft dark brown sandy slightly gravelly clay with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone). Soft grey mottled orange brown slightly sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes mudstone, sandstone and limestone. Cobbles are subrounded to subangular and include sandstone and mudstone. at c.0.50m BGL ... clay is of intermediate plasticity. at c.0.75m BGL ... very clayey very sandy gravel.	
1.50 1.75 2.00 2.30 2.50	J6 B7 ES8 J9 B10		288.85		2.20		Firm dark grey slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles are subrounded and include mudstone and sandstone.
3.30 3.50 3.50	J11 ES12 B13				(2.30)		
4.30 4.50	J14 B15		286.55		4.50	Complete at 4.50m BGL.	



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base unstable throughout excavation. Collapse back to 2.30m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
(1) Plate Load testing undertaken at 0.45m BGL.
(2) Unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB002
Client: AMEY OW Limited	Location: E:399323.080 N:513794.843		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 291.049	Start Date: 02/02/2021	Sheet: 2 of 4

Figure TP BB002.1
TP BB002



Figure TP BB002.2
TP BB002





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399323.080 N:513794.843		TP BB002
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 291.049	Start Date: 02/02/2021	Sheet: 3 of 4

Figure TP BB002.3
TP BB002



Figure TP BB002.4
TP BB002





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399323.080 N:513794.843		TP BB002
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 291.049	Start Date: 02/02/2021	Sheet: 4 of 4

Figure TP BB002.5
TP BB002



Figure TP BB002.6
TP BB002





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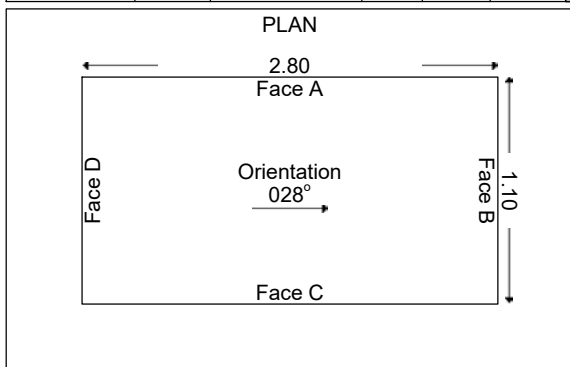
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB003	
Client: AMEY OW Limited		Location: E:399504.876 N:513818.998	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 284.107	Start Date: 04/02/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.05	J1			283.86		0.25	TOPSOIL (Soft dark brown slightly organic very silty very gravelly sand with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone). at c.0.05m BGL ... silt fines are of intermediate plasticity. Very weak grey slightly silty MUDSTONE distinctly weathered. <i>Terminated at 0.35m BGL - due to possible bedrock. No room to move pit due to services, tarmac footpath and tree cover.</i>
0.10	ES2			283.76		0.35	
0.20	B3						



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for plate load testing.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399504.876 N:513818.998		TP BB003
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 284.107	Start Date: 04/02/2021	Sheet: 2 of 3

Figure TP BB003.1
TP BB003



Figure TP BB003.2
TP BB003





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399504.876 N:513818.998		TP BB003
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 284.107	Start Date: 04/02/2021	Sheet: 3 of 3

Figure TP BB003.3
TP BB003



Figure TP BB003.4
TP BB003





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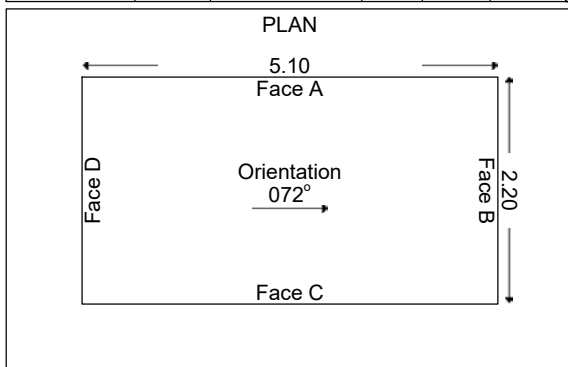
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB004	
Client: AMEY OW Limited		Location: E:399579.856 N:513838.054	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 290.243	Start Date: 03/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1	43 (21)kPa		290.09	XXXXXX	0.15	MADE GROUND (Soft dark brown sandy slightly gravelly clay with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, brick and limestone).	
0.20	J2			(1.05)				Soft grey mottled orange brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular and includes mudstone, sandstone and limestone. Cobbles are subrounded to subangular and include sandstone and mudstone.
0.30	ES3							
0.50	B4							
0.50	HSV							
1.00	ES5	45 (20)kPa		289.04		1.20	Soft brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.	
1.30	J6			(1.00)				
1.50	B7							
1.50	HSV							
2.30	J8			288.04		2.20	Firm to stiff dark grey slightly sandy gravelly CLAY with medium cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles and boulders are subrounded and include mudstone and sandstone. between c.2.20-4.50m BGL ... limestone boulder. at c.3.30m BGL ... clay is of low plasticity.	
2.50	B9			(2.30)				
2.50	ES10							
3.30	J11							
3.50	B12							
4.30	J13			285.74		4.50	Complete at 4.50m BGL.	
4.50	B14							
4.50	ES15							



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
(1) Unsuitable for HSV testing (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB004
Client: AMEY OW Limited	Location: E:399579.856 N:513838.054		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 290.243	Start Date: 03/02/2021	Sheet: 2 of 5

Figure TP BB004.1
TP BB004



Figure TP BB004.2
TP BB004





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Tel: 01772 735 300 Fax: 01772 735 999

TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB004
Client: AMEY OW Limited	Location: E:399579.856 N:513838.054		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 290.243	Start Date: 03/02/2021	Sheet: 3 of 5

Figure TP BB004.3
TP BB004



Figure TP BB004.4
TP BB004





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB004	
Client: AMEY OW Limited	Location: E:399579.856 N:513838.054		Sheet: 4 of 5
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 290.243	Start Date: 03/02/2021	

Figure TP BB004.5
TP BB004



Figure TP BB004.6
TP BB004





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB004
Client: AMEY OW Limited	Location: E:399579.856 N:513838.054		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 290.243	Start Date: 03/02/2021	Sheet: 5 of 5

Figure TP BB004.7
TP BB004





ALLIED EXPLORATION & GEOTECHNICS LIMITED

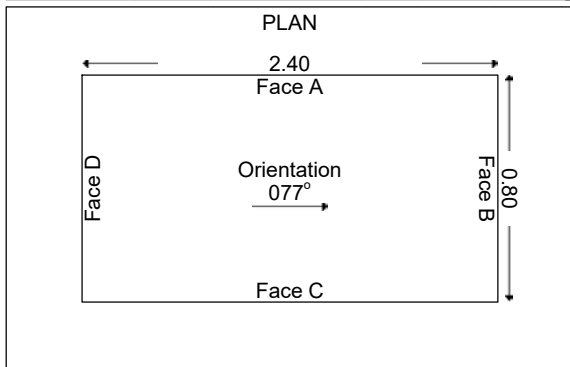
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB005	
Client: AMEY OW Limited		Location: E:398756.092 N:513423.416	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 275.330	Start Date: 18/02/2021
			Sheet: 1 of 4

SAMPLES & TESTS			STRATA						
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description		
0.10	J1	45 (19)kPa		275.13		0.20	MADE GROUND (Brown sandy slightly gravelly organic clay with many rootlets. Sand is fine to medium. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone and coal).		
0.30	J2			(0.80)					
0.30	ES3			274.33		1.00	(0.60)	MADE GROUND (Dark grey and dark brownish grey very clayey very sandy gravel with low cobble content, victorian pottery and timber. Gravel is fine to coarse angular to subrounded and includes coal, clinker and sandstone. Cobbles are subangular and include sandstone and clinker).	
0.50-0.70	B4								
1.00-1.10	J5	47 (20)kPa		273.73		1.60	Firm grey becoming greyish brown mottled orange brown slightly peaty sandy organic CLAY with traces of fibrous plant remains.		
1.00-1.20	B6								
1.20	ES7					2.00-2.20	B9	2.20	Firm to stiff brown and grey sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, mudstone, limestone and metamorphic lithologies. Cobbles are subrounded and include mudstone, limestone and sandstone.
1.20	HSV								
1.50	J8	2.40	ES10	2.40	at c.2.70m BGL ... clay is of intermediate plasticity.				
2.00-2.20	B9	3.00-3.20		271.03		(2.70)	Grey thinly bedded COBBLES. Cobbles are angular to subangular and include limestone. (Possible Limestone Bedrock). <i>Complete at 4.50m BGL.</i>		
2.20	ES10								
2.40	HSV								
2.70	J11								
3.00-3.20	B12	4.00-4.20		270.83		4.30	Grey thinly bedded COBBLES. Cobbles are angular to subangular and include limestone. (Possible Limestone Bedrock). <i>Complete at 4.50m BGL.</i>		
3.70	J13								
4.00-4.20	B14	4.50		270.83		4.50	Grey thinly bedded COBBLES. Cobbles are angular to subangular and include limestone. (Possible Limestone Bedrock). <i>Complete at 4.50m BGL.</i>		
4.50	J15								



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
(1) Soakaway tests undertaken at 2.00m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Beckett	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:398756.092 N:513423.416		TP BB005
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 275.330	Start Date: 18/02/2021	Sheet: 2 of 4

Figure TP BB005.1
TP BB005



Figure TP BB005.2
TP BB005





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB005	
Client: AMEY OW Limited	Location: E:398756.092 N:513423.416		Sheet: 3 of 4
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 275.330	Start Date: 18/02/2021	

Figure TP BB005.3
TP BB005



Figure TP BB005.4
TP BB005





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB005
Client: AMEY OW Limited	Location: E:398756.092 N:513423.416		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 275.330	Start Date: 18/02/2021	Sheet: 4 of 4

Figure TP BB005.5
TP BB005





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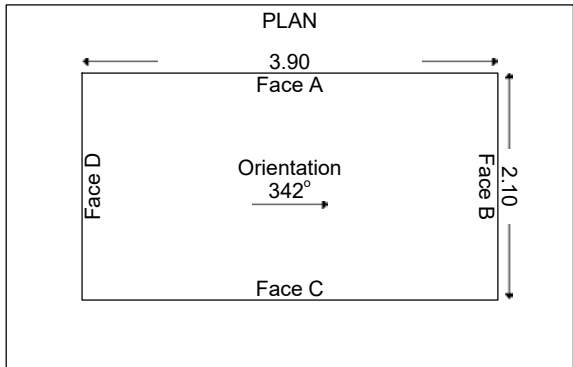
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB006	
Client: AMEY OW Limited		Location: E:399718.809 N:513833.122	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 289.337	Start Date: 03/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.00	J1			289.29		0.05	MADE GROUND (Soft dark brown sandy slightly gravelly clay with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, brick and limestone).
0.10	J2			288.99		0.35	
0.20	ES3						MADE GROUND (Black clayey slightly sandy gravel with ceramic tile. Sand is fine to coarse and includes ash. Gravel is fine to coarse subangular to angular and includes brick, macadam, sandstone and limestone).
0.30	B4						
0.50	J5						Soft brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.
1.00	ES6					(1.45)	
1.20	B7						Firm to stiff dark grey slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, mudstone and limestone. Cobbles are subrounded and include mudstone and sandstone. at c.1.90m BGL ... clay is of low plasticity.
1.50	J8			287.54		1.80	
1.90	J9						Complete at 4.50m BGL.
2.20	B10						
2.50	ES11	118 (40)kPa					
2.50	J12						
2.50	HSV						
3.20	B13					(2.70)	
3.50	J14	113 (44)kPa					
3.50	HSV						
4.20	B15						
4.50	J16			284.84		4.50	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for HSV testing below 3.50m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB006	
Client: AMEY OW Limited	Location: E:399718.809 N:513833.122		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.337	Start Date: 03/02/2021	Sheet: 2 of 4

Figure TP BB006.1
TP BB006



Figure TP BB006.2
TP BB006





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399718.809 N:513833.122		TP BB006
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.337	Start Date: 03/02/2021	Sheet: 3 of 4

Figure TP BB006.3
TP BB006



Figure TP BB006.4
TP BB006





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399718.809 N:513833.122		TP BB006
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 289.337	Start Date: 03/02/2021	Sheet: 4 of 4

Figure TP BB006.5
TP BB006



Figure TP BB006.6
TP BB006





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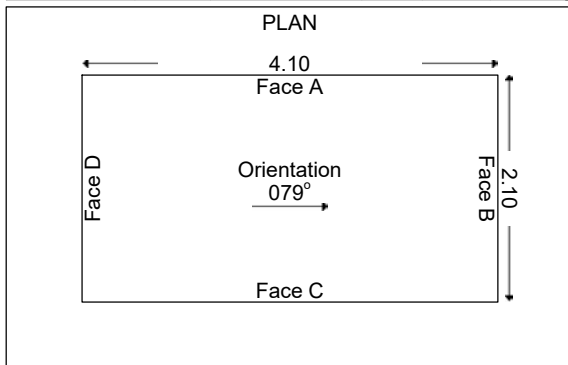
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB007	
Client: AMEY OW Limited		Location: E:399673.121 N:513763.204	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 286.130	Start Date: 03/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.15	J1	41 (19)kPa		285.98		0.15	MADE GROUND (Soft dark brown sandy slightly gravelly clay with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, brick and limestone).	
0.40	J2			(1.05)				Soft grey mottled orange brown slightly sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular and includes mudstone, sandstone and limestone. Cobbles are subrounded to subangular and include sandstone and mudstone. at c.0.40m BGL ... clay is of intermediate plasticity.
0.40	ES3							
0.50	HSV							
0.80	B4							
1.00	ES5	49 (23)kPa		284.93		1.20	Soft dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone.	
1.40	J6			(1.30)				
1.50	HSV							
1.80	B7							
2.50	ES8				(2.00)			
2.70	J9							
3.00	B10							
3.70	J11							
4.00	B12							
4.50	J13			281.63		4.50	Complete at 4.50m BGL.	



GROUNDWATER
 Groundwater seepage inflow at 4.40m BGL (Slow inflow).

STABILITY
 Pit sides and base moderately stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399673.121 N:513763.204	TP BB007	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 286.130	Start Date: 03/02/2021	Sheet: 2 of 4

Figure TP BB007.1
TP BB007



Figure TP BB007.2
TP BB007





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399673.121 N:513763.204		TP BB007
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 286.130	Start Date: 03/02/2021	Sheet: 3 of 4

Figure TP BB007.3
TP BB007



Figure TP BB007.4
TP BB007





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399673.121 N:513763.204	TP BB007	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 286.130	Start Date: 03/02/2021	Sheet: 4 of 4

Figure TP BB007.5
TP BB007



Figure TP BB007.6
TP BB007





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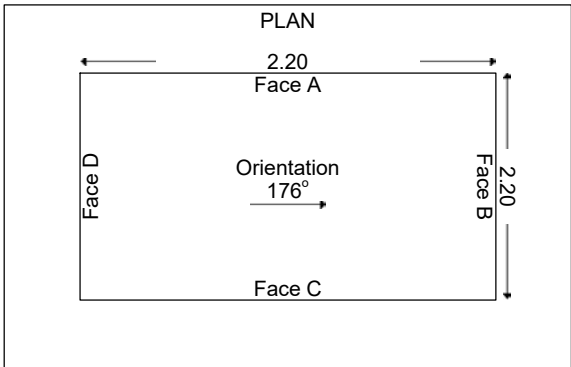
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:400085.305 N:513784.079		TP BB008
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 282.961	Start Date: 05/02/2021	Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1	44 (24)kPa	Water	282.76	[Cross-hatched]	0.20	MADE GROUND (Topsoil comprising dark brown clayey slightly gravelly sand with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to medium subrounded and includes sandstone, limestone and mudstone).
0.30	ES2			[Dotted]	(0.90)	Soft brown slightly sandy slightly gravelly CLAY/SILT with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, limestone and mudstone. Cobbles are subrounded and include sandstone and mudstone.	
0.40	HSV			[Dotted]	(0.50)	at c.0.45m BGL ... clay/silt of intermediate plasticity.	
0.45	J3			[Dotted]			
0.80	B4			[Dotted]			
1.00	ES5			281.86	[Dotted]	1.10	Light brown very clayey very sandy GRAVEL. Gravel is fine to coarse angular and includes mudstone.
1.20	J6				[Dotted]		Very weak thinly laminated grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to coarse angular).
1.40	B7			281.36	[Dotted]	1.60	Terminated at 1.70m BGL - repeated collapse of long faces.
1.70	J8			281.26	[Dotted]	1.70	



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base unstable throughout excavation. Repeated collapse of Face A and Face C.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Plate Load testing undertaken at 0.40m BGL.
 (2) Unsuitable for HSV testing below 1.10m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB008
Client: AMEY OW Limited	Location: E:400085.305 N:513784.079		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 282.961	Start Date: 05/02/2021	Sheet: 2 of 4

Figure TP BB008.1
TP BB008



Figure TP BB008.2
TP BB008





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400085.305 N:513784.079		TP BB008
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 282.961	Start Date: 05/02/2021	Sheet: 3 of 4

Figure TP BB008.3
TP BB008



Figure TP BB008.4
TP BB008





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400085.305 N:513784.079		TP BB008
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 282.961	Start Date: 05/02/2021	Sheet: 4 of 4

Figure TP BB008.5
TP BB008



Figure TP BB008.6
TP BB008





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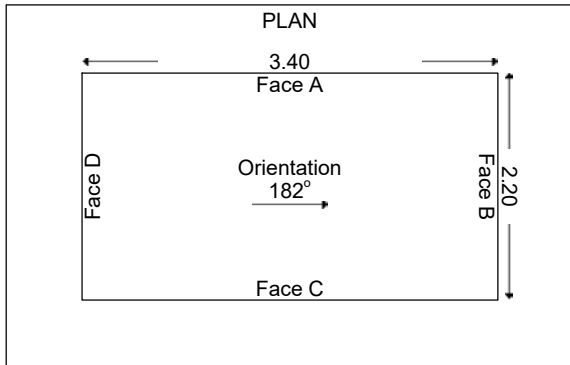
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB009	
Client: AMEY OW Limited		Location: E:400178.332 N:513743.428	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 278.643	Start Date: 05/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Description
0.10	J1				(0.45)	MADE GROUND (Topsoil comprising dark brown clayey slightly gravelly sand with many rootlets and ceramic tile. Sand is fine to coarse. Gravel is fine to medium subrounded and includes sandstone, limestone and mudstone).
0.30	ES2			278.19	0.45	
0.50	J3					Soft brown mottled orange and grey slightly sandy slightly gravelly CLAY with medium cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone, limestone and mudstone. Cobbles and boulders are subrounded and include sandstone, mudstone and limestone. at c.1.50m BGL ... clay is of high plasticity.
0.80	B4	43 (21)kPa			(2.05)	
0.80	HSV					
1.00	ES5					
1.50	J6					
1.80	B7	42 (20)kPa				Soft to firm very gravelly CLAY. Gravel is fine to coarse angular and includes mudstone. Very weak thinly laminated grey MUDSTONE distinctly weathered. (Recovered as gravel. Gravel is fine to coarse angular). <i>Terminated at 2.70m BGL - repeated collapse of long faces.</i>
1.80	HSV					
2.40	ES8			276.14	2.50	
2.55	J9			276.04	2.60	
2.65	J10			275.94	2.70	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base unstable throughout excavation. Repeated collapse of Face A and Face C.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Unsuitable for HSV testing below 0.50m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400178.332 N:513743.428		TP BB009
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 278.643	Start Date: 05/02/2021	Sheet: 2 of 5

Figure TP BB009.1
TP BB009



Figure TP BB009.2
TP BB009





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400178.332 N:513743.428		TP BB009
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 278.643	Start Date: 05/02/2021	Sheet: 3 of 5

Figure TP BB009.3
TP BB009



Figure TP BB009.4
TP BB009





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400178.332 N:513743.428		TP BB009
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 278.643	Start Date: 05/02/2021	Sheet: 4 of 5

Figure TP BB009.5
TP BB009



Figure TP BB009.6
TP BB009





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB009
Client: AMEY OW Limited	Location: E:400178.332 N:513743.428		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 278.643	Start Date: 05/02/2021	Sheet: 5 of 5

Figure TP BB009.7
TP BB009





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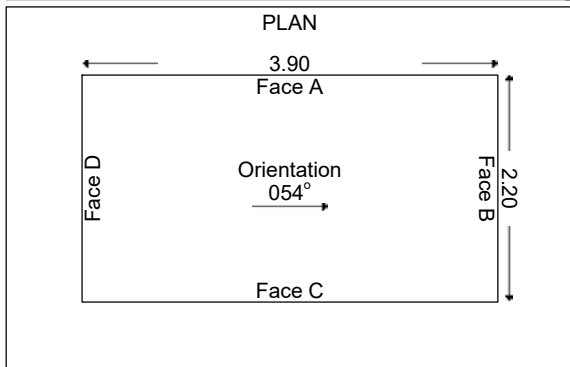
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB010	
Client: AMEY OW Limited		Location: E:400484.372 N:513641.395	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 265.138	Start Date: 04/02/2021
		Sheet: 1 of 5	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20 0.35	J1 ES2 J3		~	264.99		0.15	TOPSOIL (Soft dark brown sandy slightly gravelly clay with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone).
0.70 0.70 1.00	B4 HSV ES5	37 (20)kPa	↓			(1.45)	Soft orange mottled grey slightly sandy gravelly CLAY/SILT. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and limestone. at c.0.35m BGL ... clay is of intermediate plasticity.
1.35 1.70 2.00	J6 J7 B8		↓	263.54		1.60	Very soft dark grey slightly sandy slightly gravelly SILT. Sand is medium to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone. at c.1.70m BGL ... clay of low plasticity. from c.2.00m BGL ... becomes thinly laminated.
2.50 2.70 2.70 3.00	ES9 J10 HSV B11	20 (9)kPa	↓	262.04		3.10	Terminated at 3.10m BGL - due to collapse.



GROUNDWATER
 Groundwater seepage at 0.15m BGL (Slow inflow). Groundwater strikes at 1.20m and 2.60m BGL (Moderate inflow).

STABILITY
 Pit sides and base unstable throughout excavation. Repeated collapse - collapsed back to 2.40m BGL.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Plate Load testing undertaken at 0.35m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400484.372 N:513641.395		TP BB010
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.138	Start Date: 04/02/2021	Sheet: 2 of 5

Figure TP BB010.1
TP BB010



Figure TP BB010.2
TP BB010



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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400484.372 N:513641.395		TP BB010
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.138	Start Date: 04/02/2021	Sheet: 3 of 5

Figure TP BB010.3
TP BB010



Figure TP BB010.4
TP BB010





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400484.372 N:513641.395	TP BB010	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.138	Start Date: 04/02/2021	Sheet: 4 of 5

Figure TP BB010.5
TP BB010



Figure TP BB010.6
TP BB010





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB010
Client: AMEY OW Limited	Location: E:400484.372 N:513641.395		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.138	Start Date: 04/02/2021	Sheet: 5 of 5

Figure TP BB010.7
TP BB010





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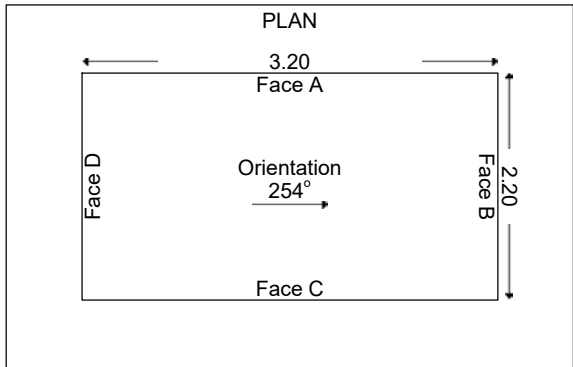
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB011	
Client: AMEY OW Limited		Location: E:400597.701 N:513570.869	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 265.858	Start Date: 08/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10 0.20 0.30	J1 J2 ES3	47 (23)kPa		265.71		0.15	MADE GROUND (Soft dark brown sandy slightly gravelly clay with many rootlets. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone).
				(0.65)			
0.70 0.70 1.00 1.20	B4 HSV J5 ES6			265.06		0.80	MADE GROUND (Dark grey very clayey very sandy gravel with low cobble content and occasional plastic and ceramic tile fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded and includes mudstone, brick, macadam and sandstone. Cobbles are subrounded and include mudstone and sandstone). at c.0.20m BGL ... clay is of intermediate plasticity.
				(1.40)			
1.70 2.00	B7 J8			263.66		2.20	Soft light brown sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded and includes sandstone and mudstone. Cobbles are subrounded and include sandstone.
				(1.30)			
2.30 2.50 2.70	J9 ES10 B11			262.36		3.50	Firm dark grey silty slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse subrounded and includes mudstone.
				(1.00)			
3.30 3.60 4.00	J12 J13 B14			261.36		4.50	Soft dark grey and brown sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse subrounded to subangular and includes sandstone, mudstone and limestone. Cobbles are subrounded and include sandstone and mudstone.
				Complete at 4.50m BGL.			



GROUNDWATER
 Groundwater strike at 3.25m BGL (Moderate inflow). Water level at 4.20m BGL on completion.

STABILITY
 Pit sides and base slightly stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) 3No. Soakaway tests undertaken at 2.00m BGL.
 (2) Below 2.20m BGL recovered material unsuitable for HSV Testing.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Myall	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400597.701 N:513570.869		TP BB011
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.858	Start Date: 08/02/2021	Sheet: 2 of 4

Figure TP BB011.1
TP BB011



Figure TP BB011.2
TP BB011





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400597.701 N:513570.869	TP BB011	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.858	Start Date: 08/02/2021	Sheet: 3 of 4

Figure TP BB011.3
TP BB011



Figure TP BB011.4
TP BB011





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400597.701 N:513570.869		TP BB011
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.858	Start Date: 08/02/2021	Sheet: 4 of 4

Figure TP BB011.5
TP BB011



Figure TP BB011.6
TP BB011





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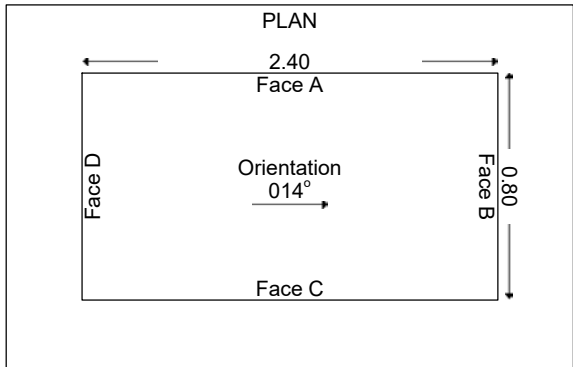
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB012	
Client: AMEY OW Limited		Location: E:400884.099 N:513627.497	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 266.743	Start Date: 09/02/2021
		Sheet: 1 of 3	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.20	J1		Water	266.49		0.25	TOPSOIL (Dark brown slightly peaty slightly sandy slightly gravelly organic silt with many rootlets). at c.0.20m BGL ... silt is of very high plasticity.	
0.25	ES2							
0.45	J3							
0.50	J4							
0.80-1.00	B5					(1.45)	Firm yellowish brown mottled grey slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to surrounded and includes sandstone and metamorphic lithologies. Cobbles are subangular to surrounded and include sandstone and metamorphic lithologies. at c.0.50m BGL ... clay is of low plasticity.	
1.20	ES6							
1.50	J7				265.04		1.70	Firm brown mottled grey slightly sandy gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse subangular to subrounded and includes sandstone. Cobbles and boulders are subangular to subrounded and include sandstone.
1.80-2.00	B8						(0.70)	
2.40	ES9				264.34		2.40	Terminated at 2.40m BGL - due to large boulders (refusal).



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Plate Load testing undertaken at 0.50m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Beckett	Contract No. 4322C
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB012
Client: AMEY OW Limited	Location: E:400884.099 N:513627.497		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 266.743	Start Date: 09/02/2021	Sheet: 2 of 3

Figure TP BB012.1
TP BB012



Figure TP BB012.2
TP BB012





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:400884.099 N:513627.497		TP BB012
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 266.743	Start Date: 09/02/2021	Sheet: 3 of 3

Figure TP BB012.3
TP BB012



Figure TP BB012.4
TP BB012





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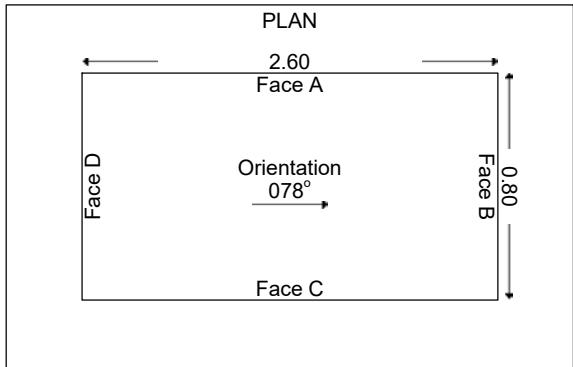
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No.	
Client: AMEY OW Limited		Location: E:401002.637 N:513613.970		TP BB013
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 265.155	Start Date: 09/02/2021	Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.10	J1			264.91		0.25	TOPSOIL (Dark brown clayey gravelly sand with many rootlets).
0.30	J2					(0.45)	Firm yellowish brown mottled grey slightly sandy slightly gravelly SILT with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies. at c.0.30m BGL ... silt is of high plasticity.
0.30	ES3						
0.55	J4			264.46		0.70	
0.70	J5						
0.80-1.00	B6						
1.20	ES7					(2.00)	Firm brown mottled grey slightly sandy gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse subangular to subrounded and includes sandstone. Cobbles and boulders are subangular to subrounded and include sandstone.
1.70	J8						
1.80-2.00	B9						
2.80	J10			262.46		2.70	Stiff grey slightly sandy slightly gravelly to gravelly CLAY with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone and metamorphic lithologies. Cobbles are subangular and include sandstone. <i>Terminated at 2.90m BGL - due to large boulders (refusal).</i>
2.80-2.90	B11			262.26		2.90	



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
(1) Plate Load testing undertaken at 0.50m BGL.

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Beckett	Contract No. 4322C
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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB013
Client: AMEY OW Limited	Location: E:401002.637 N:513613.970		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.155	Start Date: 09/02/2021	Sheet: 2 of 4

Figure TP BB013.1
TP BB013



Figure TP BB013.2
TP BB013





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB013
Client: AMEY OW Limited	Location: E:401002.637 N:513613.970		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.155	Start Date: 09/02/2021	Sheet: 3 of 4

Figure TP BB013.3
TP BB013



Figure TP BB013.4
TP BB013





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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB013
Client: AMEY OW Limited	Location: E:401002.637 N:513613.970		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 265.155	Start Date: 09/02/2021	Sheet: 4 of 4

Figure TP BB013.5
TP BB013





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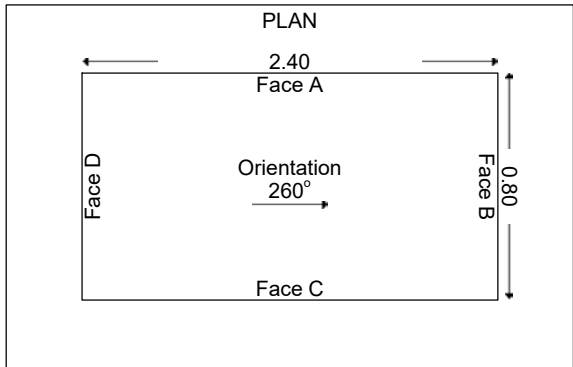
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. TP BB014	
Client: AMEY OW Limited		Location: E:401406.519 N:513591.734	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)		Ground Level (m): 261.646	Start Date: 18/02/2021
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA					
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description	
0.10	J1		↓ Water	261.35		0.30	TOPSOIL (Greyish brown sandy slightly gravelly organic clay with many rootlets. Sand is fine. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone).	
0.40	J2			(1.30)				Firm brown mottled grey sandy slightly gravelly CLAY with medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are subangular to subrounded and include sandstone and metamorphic lithologies.
0.40	ES3							
0.60	J4							
0.80-1.00	B5							
1.20	ES6				260.05		1.60	Brown to grey brown very clayey very sandy GRAVEL with medium cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles are angular to subrounded and include sandstone and limestone.
1.70	J7				259.75		1.90	
1.70-1.90	B8							
2.00	J9							
2.20	ES10				258.95		2.70	Firm to stiff dark grey slightly sandy gravelly CLAY with low cobble and boulder content. Gravel is fine to coarse angular to subrounded and includes sandstone, mudstone and metamorphic lithologies. Cobbles and boulders are subangular to subrounded and include sandstone and mudstone. at c.2.00m BGL ... clay is of low plasticity.
2.20-2.40	B11							
2.80	J12							
3.00-3.20	B13							
3.50	HSV	120 kPa				(1.80)	Stiff to very stiff grey slightly sandy gravelly CLAY with low cobble and boulder content. Gravel is fine to coarse subangular to subrounded and includes sandstone and mudstone. Cobbles and boulders are subangular to subrounded and include sandstone and mudstone.	
3.80	J14							
4.00-4.20	B15			257.15		4.50		
							Complete at 4.50m BGL.	



GROUNDWATER
 Water strike at 1.60m BGL - moderate inflow)

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS
 (1) Soakaway testing undertaken at 2.00m BGL.
 (2) Unsuitable for HSV testing between 1.90-2.70m BGL (too gravelly).

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: J. Beckett	Contract No. 4322C
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TRIAL PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:401406.519 N:513591.734		TP BB014
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 261.646	Start Date: 18/02/2021	Sheet: 2 of 4

Figure TP BB014.1
TP BB014



Figure TP BB014.2
TP BB014





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TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7			Exploratory Hole No. TP BB014
Client: AMEY OW Limited	Location: E:401406.519 N:513591.734		
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 261.646	Start Date: 18/02/2021	Sheet: 3 of 4

Figure TP BB014.3
TP BB014



Figure TP BB014.4
TP BB014





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Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

TRIAL PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:401406.519 N:513591.734	TP BB014	
Method (Equipment): Machine Excavated (14 Tonne 360 Tracked Excavator)	Ground Level (m): 261.646	Start Date: 18/02/2021	Sheet: 4 of 4

Figure TP BB014.5
TP BB014



Figure TP BB014.6
TP BB014



Inspection Pit Records





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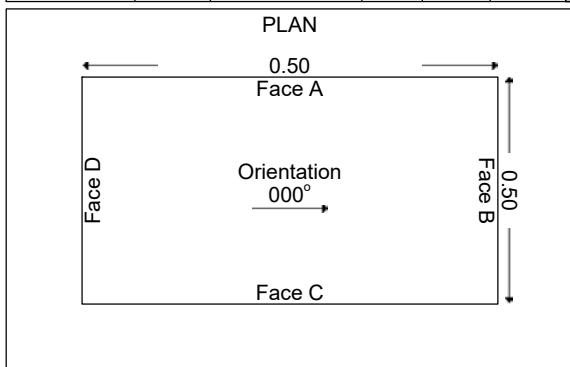
Tel: 0191 387 4700 Fax: 0191 387 4710
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INSPECTION PIT RECORD

Status:-
FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No. HDP BB001	
Client: AMEY OW Limited		Location: E:399501.212 N:513824.878	
Method (Equipment): Hand Excavated (Hand Tools)		Ground Level (m): 287.154	Start Date: 05/02/2021
		Sheet: 1 of 2	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	Description
0.20	ES1					(0.40)	Friable slightly sandy gravelly CLAY with many rootlets. Gravel is fine to medium subangular and includes sandstone and mudstone. Sand is fine to coarse. Weak grey MUDSTONE partially weathered. (Recovered as gravel. Gravel is fine to coarse angular). <i>Terminated at 0.50m BGL - due to possible bedrock.</i>
0.30	B2			286.75		0.40	
0.50	J3			286.65		0.50	



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides and base stable throughout excavation.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

GENERAL REMARKS

All dimensions in metres Scale 1:50.00	For explanation of symbols and abbreviations see Key Sheets		Logged by: D. Portsmouth	Contract No. 4322C
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Tel: 01772 735 300 Fax: 01772 735 999

INSPECTION PIT RECORD

Status:-

FINAL

Project: A66 North Trans Pennine Scheme D Section 7		Exploratory Hole No.	
Client: AMEY OW Limited	Location: E:399501.212 N:513824.878		HDP BB001
Method (Equipment): Hand Excavated (Hand Tools)	Ground Level (m): 287.154	Start Date: 05/02/2021	Sheet: 2 of 2

Figure HDP BB001.1
HDP BB001



Figure HDP BB001.2
HDP BB001



Groundwater Observations Made at the Time of Site Works



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GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (WATER STRIKES)

Exploratory Hole No.	Date	Depth of Water (m)	Depth of Casing (m)	Depth Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
BH BB003	03/02/2021	8.50	2.50								Water strike.
BH BB004	17/02/2021	4.20	3.80		2.83	20	3.86	3.49	3.17	2.83	Water inflow (moderate inflow).
BH BB005	18/02/2021	3.80	3.80		2.74	20	3.42	3.16	2.86	2.74	Water strike (slow inflow).
BH BB006	19/02/2021	4.80	4.80		4.11	20	4.32	4.21	4.16	4.11	Water strike (moderate inflow).
BH BB008	11/02/2021	2.30	2.00		1.80	20	1.80	1.80	1.80	1.80	Water strike (heavy inflow).
BH BB009	10/02/2021	5.00	5.00		2.80	20	4.10	3.40	2.80	2.80	Water strike (heavy inflow).
BH BB015	12/02/2021	4.40			3.35	20	3.80	3.60	3.46	3.35	Water strike.
BH BB018	12/02/2021	1.20			0.72	20	1.06	0.93	0.81	0.72	Water strike (moderate inflow).
BH BB021	11/02/2021	1.65	1.00		0.52	20	1.04	0.86	0.67	0.52	Water strike (heavy inflow).
TP BB010	04/02/2021	1.20									Water strike (moderate inflow).
TP BB010	04/02/2021	2.60									Water strike (moderate inflow).
TP BB011	08/02/2021	3.25									Water strike (moderate inflow).



Contract Title :-

A66 North Trans Pennine Scheme D Section 7

Client :-

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 Tel: 01772 735 300 Fax: 01772 735 999

GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITE WORKS (WATER STRIKES)

Exploratory Hole No.	Date	Depth of Water (m)	Depth of Casing (m)	Depth Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
TP BB014	18/02/2021	1.60									Water strike.



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Groundwater Monitoring Results



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Tel: 01772 735 300 Fax: 01772 735 999

GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BHBB002	31/03/2021 15:11	4.30m 19mm SPIE	296.21	2.16	294.05	
BHBB002	08/04/2021 11:31	4.30m 19mm SPIE	296.21	2.18	294.03	
BHBB002	23/04/2021 08:56	4.30m 19mm SPIE	296.21	2.26	293.95	
BHBB002	29/04/2021 09:12	4.30m 19mm SPIE	296.21	2.25	293.96	
BHBB002	06/05/2021 09:37	4.30m 19mm SPIE	296.21	2.22	293.99	
BHBB002	27/08/2021 08:57	4.30m 19mm SPIE	296.21	2.36	293.85	
BHBB003	31/03/2021 15:05	11.00m 19mm SPIE	287.56	7.52	280.04	
BHBB003	08/04/2021 11:21	11.00m 19mm SPIE	287.56	7.50	280.06	
BHBB003	23/04/2021 09:07	11.00m 19mm SPIE	287.56	7.61	279.95	
BHBB003	29/04/2021 09:00	11.00m 19mm SPIE	287.56	7.61	279.95	
BHBB003	06/05/2021 09:22	11.00m 19mm SPIE	287.56	7.56	280.00	
BHBB003	27/08/2021 08:48	11.00m 19mm SPIE	287.56	7.65	279.91	
BHBB004	31/03/2021 15:19	4.50m 19mm SPIE	288.73	1.45	287.28	
BHBB004	08/04/2021 11:37	4.50m 19mm SPIE	288.73	1.38	287.35	
BHBB004	23/04/2021 09:20	4.50m 19mm SPIE	288.73	1.41	287.32	
BHBB004	29/04/2021 09:20	4.50m 19mm SPIE	288.73	1.48	287.25	
BHBB004	06/05/2021 09:45	4.50m 19mm SPIE	288.73	1.40	287.33	
BHBB004	27/08/2021 09:02	4.50m 19mm SPIE	288.73	1.76	286.97	
BHBB005	31/03/2021 15:28	5.00m 19mm SPIE	292.73	3.88	288.85	
BHBB005	08/04/2021 11:42	5.00m 19mm SPIE	292.73	3.90	288.83	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :-

A66 North Trans Pennine Scheme D Section 7

Client :-

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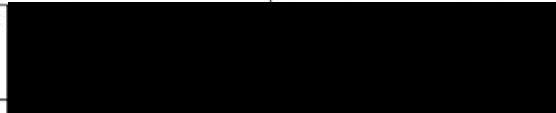
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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BHBB005	23/04/2021 09:31	5.00m 19mm SPIE	292.73	4.00	288.73	
BHBB005	29/04/2021 09:26	5.00m 19mm SPIE	292.73	4.00	288.73	
BHBB005	06/05/2021 09:57	5.00m 19mm SPIE	292.73	3.95	288.78	
BHBB005	27/08/2021 09:08	5.00m 19mm SPIE	292.73	4.09	288.64	
BHBB006	31/03/2021 15:41	5.00m 19mm SPIE	291.89	4.06	287.83	
BHBB006	08/04/2021 11:47	5.00m 19mm SPIE	291.89	4.23	287.66	
BHBB006	23/04/2021 09:44	5.00m 19mm SPIE	291.89	4.43	287.46	
BHBB006	29/04/2021 09:35	5.00m 19mm SPIE	291.89	4.35	287.54	
BHBB006	06/05/2021 10:11	5.00m 19mm SPIE	291.89	4.26	287.63	
BHBB006	27/08/2021 09:13	5.00m 19mm SPIE	291.89	Dry		
BHBB007	29/03/2021 09:50	12.00m 50mm SP	291.67	4.43	287.24	
BHBB007	31/03/2021 15:50	12.00m 50mm SP	291.67	4.45	287.22	
BHBB007	08/04/2021 12:50	12.00m 50mm SP	291.67	4.45	287.22	
BHBB007	23/04/2021 09:59	12.00m 50mm SP	291.67	4.50	287.17	
BHBB007	29/04/2021 10:16	12.00m 50mm SP	291.67	4.40	287.27	
BHBB007	06/05/2021 10:19	12.00m 50mm SP	291.67	4.33	287.34	
BHBB007	27/08/2021 09:17	12.00m 50mm SP	291.67	4.30	287.37	
BHBB008	31/03/2021 16:03	2.50m 19mm SPIE	291.19	0.69	290.50	
BHBB008	08/04/2021 12:41	2.50m 19mm SPIE	291.19	1.00	290.19	
BHBB008	23/04/2021 10:18	2.50m 19mm SPIE	291.19	1.32	289.87	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited



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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH BB008	29/04/2021 09:57	2.50m 19mm SPIE	291.19	1.32	289.87	
BH BB008	06/05/2021 10:55	2.50m 19mm SPIE	291.19	1.09	290.10	
BH BB008	27/08/2021 09:29	2.50m 19mm SPIE	291.19	1.81	289.38	
BH BB009	31/03/2021 16:12	6.50m 19mm SPIE	289.93	3.58	286.35	
BH BB009	08/04/2021 12:53	6.50m 19mm SPIE	289.93	3.72	286.21	
BH BB009	23/04/2021 10:25	6.50m 19mm SPIE	289.93	3.96	285.97	
BH BB009	29/04/2021 10:10	6.50m 19mm SPIE	289.93	3.77	286.16	
BH BB009	06/05/2021 10:30	6.50m 19mm SPIE	289.93	3.73	286.20	
BH BB009	27/08/2021 09:22	6.50m 19mm SPIE	289.93	3.95	285.98	
BH BB010	31/03/2021 16:20	2.00m 19mm SPIE	283.01	Dry		
BH BB010	08/04/2021 13:13	2.00m 19mm SPIE	283.01	Dry		
BH BB010	23/04/2021 11:05	2.00m 19mm SPIE	283.01	Dry		
BH BB010	29/04/2021 11:05	2.00m 19mm SPIE	283.01	Dry		
BH BB010	06/05/2021 11:40	2.00m 19mm SPIE	283.01	Dry		
BH BB010	27/08/2021 09:52	2.00m 19mm SPIE	283.01	Dry		
BH BB011	31/03/2021 16:26	4.00m 19mm SPIE	283.42	1.32	282.10	
BH BB011	08/04/2021 13:17	4.00m 19mm SPIE	283.42	1.30	282.12	
BH BB011	23/04/2021 11:10	4.00m 19mm SPIE	283.42	1.35	282.07	
BH BB011	29/04/2021 11:11	4.00m 19mm SPIE	283.42	1.30	282.12	
BH BB011	06/05/2021 11:50	4.00m 19mm SPIE	283.42	1.22	282.20	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BHBB011	27/08/2021 09:57	4.00m 19mm SPIE	283.42	1.43	281.99	
BHBB012	31/03/2021 16:31	8.00m 19mm SP	282.53	2.10	280.43	
BHBB012	08/04/2021 13:10	8.00m 19mm SP	282.53	2.07	280.46	
BHBB012	23/04/2021 02:12	8.00m 19mm SP	282.53	2.12	280.41	
BHBB012	29/04/2021 10:57	8.00m 19mm SP	282.53	2.08	280.45	
BHBB012	06/05/2021 11:35	8.00m 19mm SP	282.53	2.06	280.47	
BHBB012	27/08/2021 09:54	8.00m 19mm SP	282.53	2.13	280.40	
BHBB013	29/03/2021 08:40	4.00m 50mm SP	290.79	2.76	288.03	
BHBB013	31/03/2021 16:40	4.00m 50mm SP	290.79	2.85	287.94	
BHBB013	29/04/2021 11:19	4.00m 50mm SP	290.79	2.52	288.27	
BHBB013	06/05/2021 12:02	4.00m 50mm SP	290.79	2.34	288.45	
BHBB013	27/08/2021 10:33	4.00m 50mm SP	290.79	1.62	289.17	
BHBB014	01/04/2021 12:51	3.00m 19mm SPIE	284.56	1.34	283.22	
BHBB014	08/04/2021 13:27	3.00m 19mm SPIE	284.56	1.46	283.10	
BHBB014	23/04/2021 10:50	3.00m 19mm SPIE	284.56	1.80	282.76	
BHBB014	29/04/2021 10:45	3.00m 19mm SPIE	284.56	2.01	282.55	
BHBB014	06/05/2021 11:14	3.00m 19mm SPIE	284.56	1.79	282.77	
BHBB014	27/08/2021 10:40	3.00m 19mm SPIE	284.56	2.24	282.32	
BHBB015	01/04/2021 13:16	2.00m 19mm SPIE	287.20	1.47	285.73	
BHBB015	08/04/2021 13:47	2.00m 19mm SPIE	287.20	1.51	285.69	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH BB015	23/04/2021 11:23	2.00m 19mm SPIE	287.20	Dry		
BH BB015	29/04/2021 11:24	2.00m 19mm SPIE	287.20	Dry		
BH BB015	06/05/2021 12:20	2.00m 19mm SPIE	287.20	Damp		
BH BB015	27/08/2021 10:12	2.00m 19mm SPIE	287.20	Dry		
BH BB016	01/04/2021 13:27	2.00m 19mm SPIE	285.63	Dry		
BH BB016	08/04/2021 13:55	2.00m 19mm SPIE	285.63	Dry		
BH BB016	23/04/2021 11:31	2.00m 19mm SPIE	285.63	Dry		
BH BB016	29/04/2021 11:32	2.00m 19mm SPIE	285.63	Dry		
BH BB016	06/05/2021 12:31	2.00m 19mm SPIE	285.63	Dry		
BH BB016	27/08/2021 00:00	2.00m 19mm SPIE	285.63			Could not locate
BH BB018	01/04/2021 13:45	4.50m 19mm SPIE	271.41	3.87	267.54	
BH BB018	08/04/2021 14:04	4.50m 19mm SPIE	271.41	3.86	267.55	
BH BB018	23/04/2021 11:47	4.50m 19mm SPIE	271.41	4.02	267.39	
BH BB018	29/04/2021 11:51	4.50m 19mm SPIE	271.41	4.09	267.32	
BH BB018	06/05/2021 13:07	4.50m 19mm SPIE	271.41	3.92	267.49	
BH BB018	27/08/2021 00:00	4.50m 19mm SPIE	271.41			Could not locate
BH BB022	01/04/2021 14:20	3.00m 19mm SPIE	262.35	0.46	261.89	
BH BB022	08/04/2021 14:57	3.00m 19mm SPIE	262.35	0.36	261.99	
BH BB022	23/04/2021 13:04	3.00m 19mm SPIE	262.35	0.70	261.65	
BH BB022	29/04/2021 13:40	3.00m 19mm SPIE	262.35	0.78	261.57	

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
BH BB022	06/05/2021 13:34	3.00m 19mm SPIE	262.35	0.72	261.63	
BH BB022	27/08/2021 00:00	3.00m 19mm SPIE	262.35			Could not locate
BH BB023	01/04/2021 15:09	6.00m 19mm SPIE	265.46	0.98	264.48	
BH BB023	08/04/2021 15:35	6.00m 19mm SPIE	265.46	1.01	264.45	
BH BB023	23/04/2021 13:04	6.00m 19mm SPIE	265.46	1.43	264.03	
BH BB023	29/04/2021 13:53	6.00m 19mm SPIE	265.46	1.52	263.94	
BH BB023	06/05/2021 14:03	6.00m 19mm SPIE	265.46	1.45	264.01	
BH BB023	27/08/2021 12:17	6.00m 19mm SPIE	265.46	2.83	262.63	
BH BB024	01/04/2021 14:37	2.00m 19mm SPIE	264.11	1.26	262.85	
BH BB024	08/04/2021 15:04	2.00m 19mm SPIE	264.11	1.31	262.80	
BH BB024	23/04/2021 12:51	2.00m 19mm SPIE	264.11	1.49	262.62	
BH BB024	29/04/2021 13:24	2.00m 19mm SPIE	264.11	1.50	262.61	
BH BB024	06/05/2021 13:40	2.00m 19mm SPIE	264.11	1.32	262.79	
BH BB024	27/08/2021 11:47	2.00m 19mm SPIE	264.11	1.78	262.33	
BH BB025	08/04/2021 15:12	2.00m 19mm SPIE	262.94	0.20	262.74	
BH BB025	23/04/2021 12:58	2.00m 19mm SPIE	262.94	0.26	262.68	
BH BB025	29/04/2021 13:53	2.00m 19mm SPIE	262.94	0.30	262.64	
BH BB025	06/05/2021 13:52	2.00m 19mm SPIE	262.94	0.22	262.72	
BH BB025	27/08/2021 00:00	2.00m 19mm SPIE	262.94			Could not locate
WS BB002	31/03/2021 16:57	2.50m 19mm SPIE	284.99	Damp		

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme D Section 7		Client :- AMEY OW Limited	
	Certificate No. :- GWMR/4322C/6	Date of Issue :- 01/09/2021	Page No. :- 6 of 7
	Checked By :-		AEG Contract No. :- 4322C
			


ALLIED EXPLORATION & GEOTECHNICS LIMITED

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GROUNDWATER MONITORING RESULTS

Monitoring Point	Date and Time	Depth and Type of Well	Ground Level (mAOD)	Water Depth (mBGL)	Reduced Water Level (mAOD)	Remarks
WS BB002	29/04/2021 12:30	2.50m 19mm SPIE	284.99	Dry		
WS BB002	06/05/2021 09:04	2.50m 19mm SPIE	284.99	Dry		

SP = Standpipe - SPIE = Standpipe Piezometer.

Contract Title :- A66 North Trans Pennine Scheme D Section 7		Client :- AMEY OW Limited	
	Certificate No. :- GWMR/4322C/7	Date of Issue :- 01/09/2021	Page No. :- 7 of 7
	Checked By : [REDACTED]		AEG Contract No. :- 4322C

In-situ Test Report Certificate



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IN-SITU TESTING REPORT CERTIFICATE



Contract Title: A66 North Trans Pennine Scheme D Section 7 **AEG Reference:** 4322C

Client Address: AMEY OW Limited
Chancery Exchange
10 Furnival Street
London
EC4A 1AB

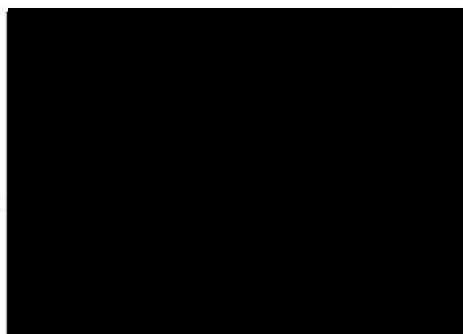
I certify that *In-situ* testing was carried out on the above contract in accordance with techniques outlined in BS 1377: 1990: Part 9 or other appropriate standards as quoted, and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Managing Director)
- Kerry Wade (Technical Manager)

Signed _____



Date: 01 September 2021

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation

IN-SITU TESTING REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Test Report Certificate	N/A		2
1	Standard Penetration Test Results (SPT)	Yes	BS 1377 Part 9 1990	39
2	Hand Shear Vane Test Results	No		4
3	Variable Head Permeability Test Results	No	BS 5930 1999:Section 4	9
4	<i>In-situ</i> Water Quality Parameter Test Results	No		1
5	Photo-ionisation Detector Test Results	No		2
6	Determination of the Soil Infiltration Rate for Soakaway Design	No	BRE Digest 365:1991	5
7	Plate Loading Test Results	No	BS 1377 Part 9 1990	6
-	Density by Core Cutter Method	Yes	BS 1377 Part 9 1990	-
-	Determination of the Vane Shear Strength (Down the Hole)	Yes	BS 1377 Part 9 1990	-
-	Shallow Pad (skip) Load Test Results	No	BS 1377 Part 9 1990	-
-	Determination of the California Bearing Ratio	Yes	BS 1377 Part 9 1990	-
-	Apparent Resistivity of Soil	No	BS 1377 Part 9 1990	-
-	Redox Potential of Soil	No	BS 1377 Part 9 1990	-

Standard Penetration Test Results





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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _s	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT N ₆₀ Value	SPT N ₆₀ Value (Corr.)	Shoe or Cone	Remarks		
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows
						mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.								mm	No.
BH BB002	1.70 (284.51)	Dry (1.70)	1.70	ATH05	59	75	6	75	5	75	6	75	6	75	6	75	5	300	22	14	14	S				
BH BB002	2.50 (293.71)	Dry (2.50)	2.50	ATH05	59	75	2	75	2	75	1	75	1	75	1	75	2	300	6	4	4	S				
BH BB002	3.50 (292.71)	2.96 (3.50)	3.50	ATH05	59	75	3	75	4	75	4	75	3	75	4	75	4	300	14	10	10	C				
BH BB002	4.50 (291.71)	3.11 (4.50)	4.50	ATH05	59	75	4	75	8	75	3	75	4	75	4	75	3	300	14	11	11	C				
BH BB003	1.70 (285.86)	Dry (1.70)	1.70	ATH05	59	75	4	75	5	75	9	75	9	75	9	75	6	300	31	20	20	S				
BH BB003	2.50 (285.06)	Dry (2.50)	2.50	ATH05	59	75	16	47	50	122	66	75	7	75	7	75	6	300	31	-	-	S				
BH BB003	3.50 (284.06)	Dry (2.50)	3.50	ATH05	59	75	21	75	29	150	50	75	14	61	50	136	64	300	64	-	-	S				
BH BB003	4.50 (283.06)	Dry (2.50)	4.50	ATH05	59	11	25	41	50	11	25	41	50	41	50	41	50	300	50	-	-	S				
BH BB003	6.00 (281.56)	Dry (2.50)	6.00	ATH05	59	10	25	63	50	10	25	63	50	63	50	63	50	300	50	-	-	S				
BH BB003	7.50 (280.06)	Dry (2.50)	7.50	ATH05	59	0	25	0	0	0	25	0	0	0	0	0	0	300	0	-	-	S				

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN₆₀ values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme D Section 7	Client :-	AMEY OW Limited	AEG Contract No. :-	4322C
	Date of Issue :-	01/09/2021	Checked By :-	[Redacted]	Certificate No. :-	SPT/4322C/1
Page No. :- 1 of 13						

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _m	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N ₆₀	Shoe or Cone	Remarks				
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows		
						mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.								mm	No.	mm	No.
BH BB005	5.00 (287.73)	0.22 (4.80)	5.00	ATH07	54	75	2	75	3	150	5	75	5	75	7	75	6	75	5	300	23	0.80	0.90	13.04	23	17	C	
BH BB005	6.00 (286.73)	0.36 (5.80)	6.00	ATH07	54	75	4	75	5	150	9	75	6	75	7	75	6	75	6	300	25	0.84	0.90	12.00	25	19	C	
BH BB005	7.00 (285.73)	0.44 (6.80)	7.00	ATH07	54	75	7	75	7	150	14	75	6	75	6	75	5	75	6	300	23	0.88	0.90	13.04	23	18	C	
BH BB005	8.00 (284.73)	0.11 (7.80)	8.00	ATH07	54	75	5	75	5	150	10	75	7	75	8	75	11	75	9	300	35	0.92	0.90	8.57	25	21	C	
BH BB006	1.20 (290.69)	Dry (1.00)	1.20	ATH07	54	75	2	75	2	150	4	75	2	75	2	75	3	75	3	300	10	0.65	0.90	30.00	10	6	S	
BH BB006	2.50 (289.39)	Dry (2.30)	2.50	ATH07	54	75	1	75	1	150	2	75	1	75	2	75	4	75	4	300	11	0.70	0.90	27.27	11	7	S	
BH BB006	3.50 (288.39)	Damp (3.30)	3.50	ATH07	54	75	2	75	2	150	4	75	2	75	2	75	3	75	10	300	17	0.74	0.90	17.65	17	11	S	
BH BB006	5.00 (286.89)	4.11 (4.80)	5.00	ATH07	54	75	4	75	5	150	9	75	5	75	5	75	5	75	6	300	21	0.80	0.90	14.29	21	15	S	
BH BB006	6.00 (285.89)	4.26 (5.80)	6.00	ATH07	54	25	50			25	50	40	100						40	100		0.84	0.90	0.40	-	-	S	
BH BB007	1.50 (290.17)	Dry (1.50)	1.50	ATH06	51	75	2	75	2	150	4	75	2	75	3	75	2	75	3	300	10	0.66	0.85	30.00	10	6	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :- A66 North Trans Pennine Scheme D Section 7

Client :- AMEY OW Limited

AEG Contract No :- 4322C

Date of Issue :- 01/09/2021

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Certificate No. :- SPT/4322C/3



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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E_p	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C_R	Energy Ratio Corr. C_e	Pen (mm)/Blow	SPT 'N' Value	SPT 'N' Value (Corr.) N_{60}	Shoe or Cone	Remarks		
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Pen	Blows
BH BB007	2.50 (289.17)	Dry (2.50)	2.50	ATH06	51	75	15	75	5	150	20	75	6	75	4	75	5	75	5	300	20	15.00	20	12	S	
BH BB007	3.50 (288.17)	Dry (3.50)	3.50	ATH06	51	75	6	75	9	150	15	75	12	75	12	75	14	49	12	274	50	5.48	-	-	S	
BH BB007	4.50 (287.17)	Dry (4.50)	4.50	ATH06	51	13	25			13	25	10	50							10	50	0.20	-	-	S	
BH BB007	4.60 (287.07)	Dry (4.60)	4.60	ATH06	51	17	50			17	50	29	100							29	100	0.29	-	-	S	
BH BB007	5.10 (286.57)	Dry (5.10)	5.10	ATH09	55	75	8	75	9	150	17	75	36	12	14					87	50	1.74	-	-	C	
BH BB007	5.60 (286.07)	Dry (5.60)	5.60	ATH09	55	75	10	75	13	150	23	75	10	75	21	7	19			157	50	3.14	-	-	C	
BH BB007	6.00 (285.67)	4.90 (6.00)	6.00	ATH09	55	75	9	75	10	150	19	75	12	75	9	75	13	42	18	267	52	5.13	-	-	C	
BH BB008	2.50 (288.69)	2.30 (2.50)	2.50	ATH06	51	75	6	75	6	150	12	75	8	75	9	75	11	75	14	300	42	7.14	42	25	S	
BH BB008	3.50 (287.69)	1.80 (3.50)	3.50	ATH06	51	75	9	61	16	136	25	75	27	28	23					103	50	2.06	-	-	S	
BH BB008	4.30 (286.89)	Dry (4.30)	4.30	ATH06	51	75	20	59	30	134	50	63	100							63	100	0.63	-	-	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT 'N' values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme D Section 7	Client :-	AEG Contract No. :- 4322C
	Date of Issue :-	01/09/2021	Certificate No. :-	SPT/4322C/4
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _s	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N ₆₀	Shoe or Cone	Remarks		
						Blows		Pen		Blows		Pen		Blows		Pen									Total Blows	Total Pen
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm									
BH BB008	5.30 (285.89)	Dry (4.70)	5.30	ATH09	55	10	75	12	75	15	75	13	75	11	75	9	236	50	4.72	-	-	C				
BH BB008	9.00 (282.19)	Damp (4.70)	9.00	ATH09	55	12	75	13	75	9	75	26	75	9	75	84	100	0.84	0.84	-	-	C				
BH BB008	12.00 (279.19)	10.10 (4.70)	12.00	ATH09	55	25	10	100	100	100	100	100	100	100	100	16	100	1.00	0.92	0.16	-	-	C			
BH BB009	1.50 (288.43)	Dry (1.50)	1.50	ATH06	51	8	75	7	75	6	75	10	75	11	75	14	300	41	7.32	41	23	S				
BH BB009	3.50 (286.43)	Dry (3.50)	3.50	ATH06	51	7	75	14	150	21	150	16	75	3	17	153	47	0.74	3.26	-	-	S				
BH BB009	4.50 (285.43)	Dry (4.50)	4.50	ATH06	51	20	12	5	87	25	75	16	75	23	23	126	50	0.78	2.52	-	-	S				
BH BB009	5.30 (284.63)	2.80 (5.30)	5.30	ATH06	51	29	30	21	105	50	42	100	42	100	42	100	100	0.81	0.42	-	-	S				
BH BB009	5.60 (284.33)	Dry (5.60)	5.60	ATH09	55	7	75	9	150	16	75	17	75	26	6	251	50	0.82	5.02	-	-	C				
BH BB010	1.20 (281.81)	Dry (1.10)	1.20	T02	53	45	45	45	45	25	48	50	48	50	48	50	50	0.65	0.96	-	-	C				
BH BB010	2.50 (280.51)	Dry (1.20)	2.50	ATH05	59	16	75	17	150	33	41	100	74	100	115	125	125	0.70	0.92	-	-	C				

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme D Section 7		Client :- AMEY OW Limited		AEG Contract No :- 4322C	
	Date of Issue :- 01/09/2021	Page No. :- 5 of 13	Checked By :- [Redacted]	Approved By :- [Redacted]	Certificate No. :- SPT/4322C/5	




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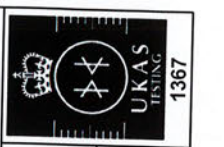
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _a	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _R	Energy Ratio Corr. C _E	Pen (mm)/Blow	SPT N Value	SPT N Value (Corr.) N ₆₀	Shoe or Cone	Remarks				
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Pen	Blows	Total Pen	Total Blows
BH BB010	5.00 (278.01)	Dry (1.20)	5.00	ATH05	59	75	21	75	24	150	45	61	100						68	125	0.80	0.98	0.54	-	-	-	C	
BH BB011	1.20 (282.22)	Dry (1.20)	1.20	ATH06	51	23	50		23	50	100								30	100	0.65	0.85	0.30	-	-	-	S	
BH BB011	1.70 (281.72)	Dry (1.20)	1.70	ATH05	59	61	25		61	25	100								57	100	0.67	0.98	0.57	-	-	-	C	
BH BB011	4.20 (279.22)	Dry (1.20)	4.20	ATH05	59	46	25		46	25	100								71	100	0.77	0.98	0.71	-	-	-	C	
BH BB012	1.20 (281.33)	Dry (1.00)	1.20	T02	53	30	25		30	25	50								43	50	0.65	0.88	0.86	-	-	-	C	
BH BB012	1.80 (280.73)	Dry (1.20)	1.80	ATH05	59	47	25		47	25	100								63	100	0.67	0.98	0.63	-	-	-	C	
BH BB012	4.10 (278.43)	Dry (1.20)	4.10	ATH05	59	11	25		11	25	46								46	100	0.76	0.98	0.46	-	-	-	C	
BH BB013	2.35 (288.44)	Dry (2.20)	2.35	T02	53	75	3	75	4	150	7	75	4	75	4	150	7	75	6	300	0.69	0.88	11.54	26	16	16	S	
BH BB013	3.40 (287.39)	Dry (3.10)	3.40	T02	53	75	3	75	4	150	7	75	7	75	10	75	10	75	8	300	0.74	0.88	9.38	32	21	21	S	
BH BB013	4.40 (286.39)	Dry (3.10)	4.40	T02	53	75	8	75	7	150	15	75	7	75	11	75	11	75	12	300	0.78	0.88	7.89	38	26	26	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme D Section 7		Client :- AMEY OW Limited	
	Date of Issue :- 01/09/2021		AEG Contract No :- 4322C	
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Checked By :- [Redacted]		SPT Contract No :- [Redacted]		





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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _p	SEATING DRIVE												TEST DRIVE												Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT N Value	SPT N Value (Corr.) N ₆₀	Shoe or Cone	Remarks
						Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		Rod Length Corr. C _r	Total Blows	Total Pen							
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm										
BH BB014	2.50 (282.06)	Dry (2.50)	2.50	ATH06	51	3	75	3	75	3	150	6	75	6	75	6	75	7	75	5	75	5	300	23	0.70	13.04	23	14	S						
BH BB014	3.50 (281.06)	3.00 (3.50)	3.50	ATH06	51	9	75	15	75	15	150	24	75	17	75	17	75	16	49	199	50	199	50	0.74	3.98	-	-	S							
BH BB014	3.70 (280.86)	1.60 (3.70)	3.70	ATH06	51	21	60	29	60	29	135	50	58	100	100	58	58	100	58	58	100	100	0.75	0.58	-	-	S								
BH BB014	4.60 (279.96)	Damp (4.60)	4.60	ATH09	55	6	75	7	75	7	150	13	75	8	75	8	75	9	75	12	75	12	300	36	0.78	8.33	36	26	S						
BH BB014	5.10 (279.46)	Damp (5.10)	5.10	ATH09	55	7	75	8	75	8	150	15	75	9	75	9	75	10	75	11	75	11	300	38	0.80	7.89	38	28	S						
BH BB014	5.60 (278.96)	Damp (5.60)	5.60	ATH09	55	10	75	9	75	9	150	19	75	12	75	12	75	15	21	246	50	246	50	0.82	4.92	-	-	S							
BH BB015	1.30 (285.90)	Dry (1.20)	1.30	T02	53	2	75	2	75	2	150	4	75	4	75	4	75	3	75	5	300	15	0.65	20.00	15	9	9	S							
BH BB015	2.30 (284.90)	Dry (1.70)	2.30	T02	53	4	75	6	75	6	150	10	75	8	75	8	75	9	75	12	300	38	0.69	7.89	38	23	23	S							
BH BB015	3.40 (283.80)	Dry (3.10)	3.40	T02	53	6	75	6	75	6	150	12	75	10	75	10	75	10	75	17	300	47	0.74	6.38	47	31	31	S							
BH BB015	4.40 (282.80)	Dry (3.10)	4.40	T02	53	9	75	13	75	13	150	22	75	15	75	15	75	20	13	170	50	170	50	0.78	3.40	-	-	S							

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme D Section 7	Client :-	AMEY OW Limited	AEG Contract No :-	4322C
	Date of Issue :-	01/09/2021	Checked By :-	[Redacted]	Certificate No :-	SPT/4322C/7
						


ALLIED EXPLORATION & GEOTECHNICS LIMITED

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 Regional Office: Unit 20 Business Development Centre, Easing Wharf, Blackburn, BB1 5BL
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E _p %	SEATING DRIVE												TEST DRIVE												Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N ₆₀	Shoe or Cone	Remarks
						Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen		Blows		Pen								
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm							
BH BB016	1.30 (284.33)	Dry (0.00)	1.30	T02	53	1	75	2	75	2	75	3	75	3	75	5	75	7	75	7	75	17	300	17	10	S										
BH BB016	2.20 (263.43)	Dry (1.80)	2.20	T02	53	14	75	11	78	25	78	25	78	25	78	50	78	50	78	50	78	50	25	25	50	S										
BH BB016	2.40 (283.23)	2.10 (1.80)	2.40	T02	53	25	15	25	15	25	15	25	25	15	25	50	32	32	32	32	32	50	32	50	50	C										
BH BB017	1.20 (279.10)	Dry (1.00)	1.20	ATH07	54	2	75	2	150	4	150	4	150	4	150	1	55	47	55	47	205	205	50	50	50	S										
BH BB017	2.00 (278.30)	Dry (1.80)	2.00	ATH07	54	14	75	11	110	25	110	25	110	25	110	75	75	100	75	100	75	75	100	100	100	S										
BH BB018	4.10 (267.31)	Dry (4.10)	4.10	ATH05	59	50	0	50	0	50	0	50	0	50	0	50	0	50	0	50	0	50	0	50	0	C										
BH BB019	1.20 (269.07)	Dry (1.00)	1.20	ATH07	54	1	75	1	150	2	150	2	150	2	150	2	75	3	75	3	300	300	10	10	10	S										
BH BB019	2.50 (267.77)	Dry (2.30)	2.50	ATH07	54	50	40	50	40	50	40	50	40	50	40	50	100	30	30	30	30	100	100	100	100	S										
BH BB020	1.20 (265.79)	Dry (1.00)	1.20	ATH07	54	2	75	3	150	5	150	5	150	5	150	2	75	2	75	2	300	300	10	10	10	S										
BH BB020	3.00 (263.99)	Dry (2.80)	3.00	ATH07	54	3	75	5	150	8	150	8	150	8	150	5	75	7	75	7	300	300	29	29	29	S										

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme D Section 7	Client :-	AMEY OW Limited	AEG Contract No. :-	4322C
	Date of Issue :-	01/09/2021	Checke	[Redacted]	Certificate No. :-	SPT/4322C/8



ALLIED EXPLORATION & GEOTECHNICS LIMITED


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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Head Office:
 Regional Office:

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E_p	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C_R	Energy Ratio Corr. C_e	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N_{60}	Shoe or Cone	Remarks						
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows				
						mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.								mm	No.	mm	No.		
BH BB020	4.00 (262.99)	Dry (3.80)	4.00	ATH07	54	75	7	75	10	150	17	75	10	75	10	75	10	75	12	75	12	300	44	0.76	0.90	6.82	44	30	S	
BH BB021	2.00 (262.43)	0.52 (2.00)	2.00	ATH07	54	75	2	75	3	150	5	75	5	75	5	75	5	75	5	75	5	300	20	0.68	0.90	15.00	20	12	S	
BH BB021	4.00 (260.43)	1.57 (4.00)	4.00	ATH07	54	75	3	75	5	150	8	75	8	75	8	75	8	75	8	75	8	300	32	0.76	0.90	9.38	32	22	S	
BH BB021	5.00 (259.43)	2.04 (4.50)	5.00	ATH07	54	75	8	75	9	150	17	75	10	75	10	75	10	75	15	55	15	280	50	0.80	0.90	5.60	-	-	S	
BH BB022	2.50 (259.85)	Dry (2.50)	2.50	ATH06	51	75	3	75	4	150	7	75	7	75	12	6	13					156	32	0.70	0.85	4.88	-	-	S	
BH BB023	1.20 (264.26)	Dry (1.00)	1.20	ATH07	54	75	2	75	3	150	5	75	4	75	4	75	5	75	5	75	5	300	18	0.65	0.90	16.67	18	11	S	
BH BB023	2.50 (262.96)	Dry (2.30)	2.50	ATH07	54	75	4	75	8	150	12	75	10	75	10	75	10	75	12	300	42	0.70	0.90	7.14	42	26	S			
BH BB023	3.50 (261.96)	Damp (3.30)	3.50	ATH07	54	75	6	75	9	150	15	75	10	75	10	75	10	75	10	75	10	300	40	0.74	0.90	7.50	40	27	S	
BH BB023	5.00 (260.46)	Damp (4.80)	5.00	ATH07	54	20	50			20	50	30	100									30	100	0.80	0.90	0.30	-	-	S	
BH BB023	6.10 (259.36)	5.69 (6.10)	6.10	ATH05	59	75	6	75	7	150	13	75	9	75	9	75	14	75	21	75	21	300	53	0.84	0.98	5.66	53	44	C	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	A66 North Trans Pennine Scheme D Section 7	Client :-	AMEY OW Limited	AEG Contract No :-	4322C
	Date of Issue :-	01/09/2021	Page No. :-	9 of 13	Certificate No. :-	SPT/4322C/9



ALLIED EXPLORATION & GEOTECHNICS LIMITED

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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)		Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _p	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT 'N' Value	SPT 'N' Value (Corr.) N ₆₀	Shoe or Cone	Remarks									
	Test Depth	m					Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Pen	Blows	Total Pen	Total Blows					
	m						mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.								mm	No.	mm	No.					
BH BB023	7.00 (258.46)	6.41 (7.00)	7.00	7.00	ATH05	59	75	10	5	75	15	47	50	75	11	75	11	47	50	75	11	75	11	47	50	122	61	0.88	0.98	2.00	-	-	C	
BH BB023	8.00 (257.46)	7.11 (8.00)	8.00	8.00	ATH05	59	75	6	5	75	11	75	11	75	10	75	11	75	11	75	21	75	29	75	300	71	0.92	0.98	4.23	64	64	C		
BH BB023	9.20 (256.26)	7.41 (8.30)	9.20	9.20	ATH05	59	75	10	14	75	24	75	13	75	9	75	11	75	13	75	14	14	14	75	300	52	0.97	0.98	5.77	49	49	C		
BH BB023	10.20 (255.26)	10.06 (9.70)	10.20	10.20	ATH05	59	75	7	6	75	13	75	9	75	9	75	10	75	11	75	11	75	8	75	300	41	1.00	0.98	7.32	40	40	C		
BH BB023	11.20 (254.26)	9.41 (9.70)	11.20	11.20	ATH05	59	75	8	9	75	17	75	9	75	9	75	11	75	11	75	9	75	8	75	300	37	1.00	0.98	8.11	36	36	C		
BH BB023	12.20 (253.26)	8.69 (9.70)	12.20	12.20	ATH05	59	75	11	14	75	25	75	47	50	50	47	50	47	50	47	50	13	41	50	191	77	1.00	0.98	0.94	-	-	C		
BH BB023	13.20 (252.26)	8.76 (9.70)	13.20	13.20	ATH05	59	75	6	5	75	11	75	14	75	14	75	11	75	13	75	11	75	9	75	14	77	1.00	0.98	2.48	-	-	C		
BH BB023	14.20 (251.26)	8.47 (9.70)	14.20	14.20	ATH05	59	75	11	10	75	21	75	11	75	11	75	11	75	11	75	9	75	14	75	300	45	1.00	0.98	6.67	44	44	C		
BH BB023	15.20 (250.26)	8.94 (9.70)	15.20	15.20	ATH05	59	75	6	7	75	13	75	8	75	9	75	8	75	8	75	9	75	9	75	300	35	1.00	0.98	8.57	34	34	C		
BH BB023	16.00 (249.46)	9.06 (9.70)	16.00	16.00	ATH05	59	75	7	9	75	16	75	11	75	10	75	11	75	11	75	14	75	16	75	300	51	1.00	0.98	5.88	50	50	C		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT 'N' values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :- A66 North Trans Pennine Scheme D Section 7

Client :- AMEY OW Limited


AEG Contract No :- 4322C

Certificate No :- SPT/4322C/10

Date of Issue :- 01/09/2021

Page No :- 10 of 13

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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E_n	SEATING DRIVE										TEST DRIVE										Energy Ratio Corr. C_e	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N_{60}	Shoe or Cone		Remarks
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows					SIC		
BH BB024	2.50 (261.61)	Dry (2.50)	2.50	ATH06	51	Pen	25	Blows	20	Pen	20	Blows	25	Pen	0	Blows	50	Pen	0	Blows	50	0.70	0.85	0.00	-	-	S					
BH BB024	3.00 (261.11)	Dry (2.50)	3.00	ATH05	59	Pen	11	Blows	50	Pen	47	Blows	61	Pen	75	Blows	11	Blows	75	7	Blows	0.72	0.98				C					
BH BB024	4.00 (260.11)	Dry (4.00)	4.00	ATH05	59	Pen	6	Blows	7	Pen	75	Blows	13	Pen	75	Blows	7	Blows	75	8	Blows	0.76	0.98	10.71	28	21	C					
BH BB024	5.00 (259.11)	Dry (4.00)	5.00	ATH05	59	Pen	8	Blows	11	Pen	75	Blows	19	Pen	75	Blows	10	Blows	75	11	Blows	0.80	0.98	7.89	38	30	C					
BH BB024	6.00 (258.11)	Dry (5.00)	6.00	ATH05	59	Pen	6	Blows	7	Pen	75	Blows	13	Pen	75	Blows	7	Blows	75	8	Blows	0.84	0.98	10.34	29	24	C					
BH BB024	7.00 (257.11)	Dry (5.00)	7.00	ATH05	59	Pen	11	Blows	9	Pen	75	Blows	20	Pen	75	Blows	8	Blows	75	11	Blows	0.88	0.98	7.89	38	33	C					
BH BB024	8.00 (256.11)	Dry (7.00)	8.00	ATH05	59	Pen	6	Blows	5	Pen	75	Blows	11	Pen	75	Blows	6	Blows	75	6	Blows	0.92	0.98	12.00	25	23	C					
BH BB024	9.00 (255.11)	Dry (7.00)	9.00	ATH05	59	Pen	11	Blows	14	Pen	75	Blows	25	Pen	61	Blows	50	Blows	75	11	Blows	0.96	0.98	1.22	50	47	C					
BH BB024	10.00 (254.11)	Dry (7.00)	10.00	ATH05	59	Pen	6	Blows	7	Pen	75	Blows	13	Pen	75	Blows	9	Blows	75	11	Blows	1.00	0.98	8.11	37	36	C					
BH BB024	11.00 (253.11)	Dry (7.00)	11.00	ATH05	59	Pen	47	Blows	50	Pen	47	Blows	50	Pen	47	Blows	50	Pen	47	Blows	50	1.00	0.98				C					

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :- A66 North Trans Pennine Scheme D Section 7

Date of Issue :- 01/09/2021

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Page No. :- 11 of 13

Client :- AMEY OW Limited

AEG Contract No. :- 4322C

Certificate No. :- SPT/4322C/11

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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ret.	Energy Ratio E_m		SEATING DRIVE						TEST DRIVE						Rod Length Corr. C_R	Energy Ratio Corr. C_E	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N_{60}	Shoe or Cone	Remarks						
					%		Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Pen	Blows	Total Pen	Total Blows		
WS BB002	4.50 (280.49)	Dry	4.50	DP04	73		75	1	75	1	75	1	75	2	75	2	75	2	75	2	75	2	75	2	75	2	300	8	8	S	
WS BB002	5.20 (279.79)	Dry	5.20	DP04	73		75	10	75	22	150	32	75	46	70	64	75	75	75	110	145	1.22	1.32	1.22	1.22	1.22	1.22	1.22	1.22	S	

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- A66 North Trans Pennine Scheme D Section 7		Client :- AMEY OW Limited		AEG Contract No. :- 4322C	
	Date of Issue :- 01/09/2021		Checked By :- [REDACTED]		Certificate No. :- SPT/4322C/13	
 1367						

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office:
Regional Office:

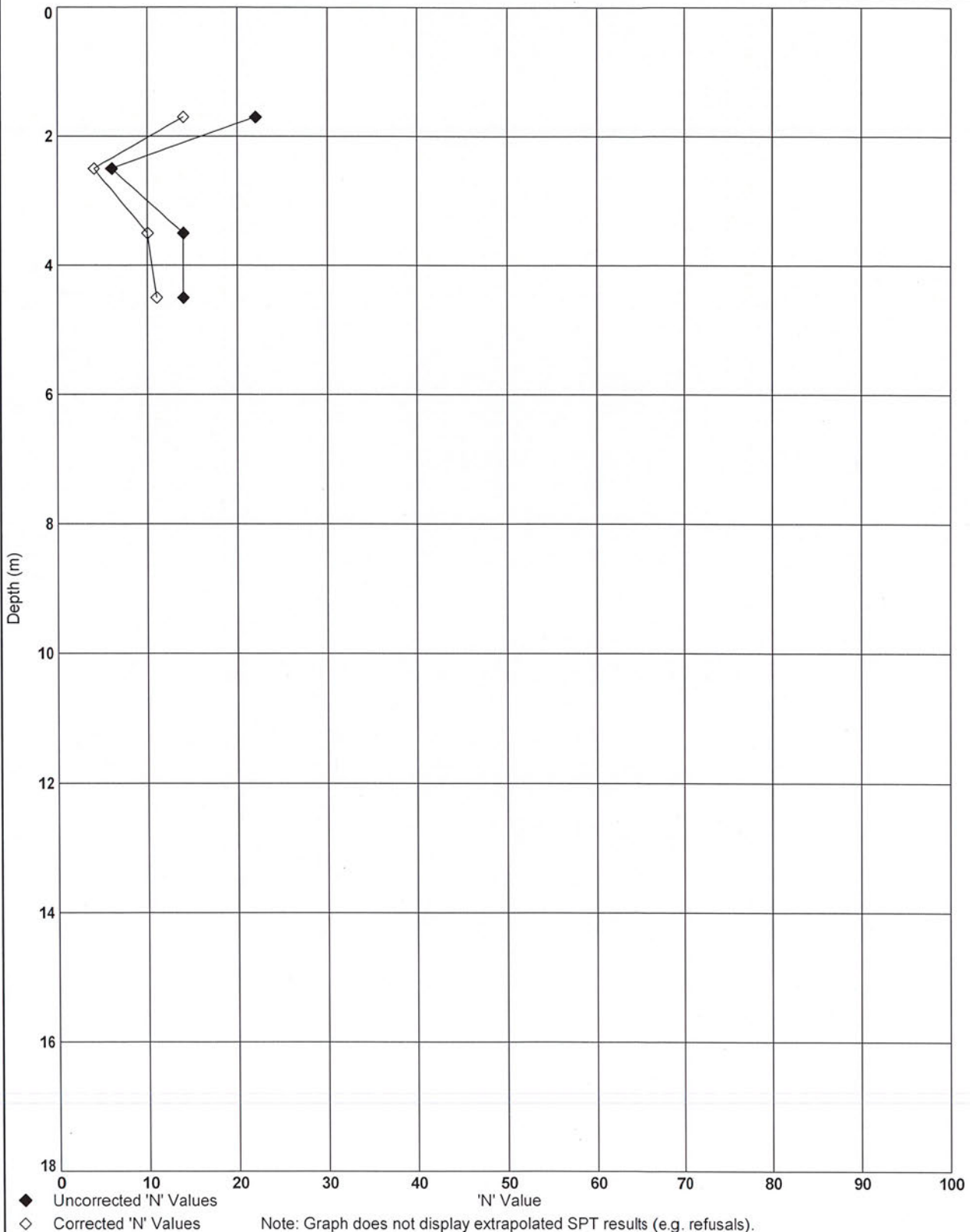
Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB002



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited

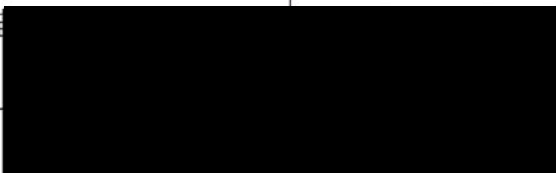


Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB002

Operator :-
E. Bacon

Checked By



AEG Contract No. :-
4322C



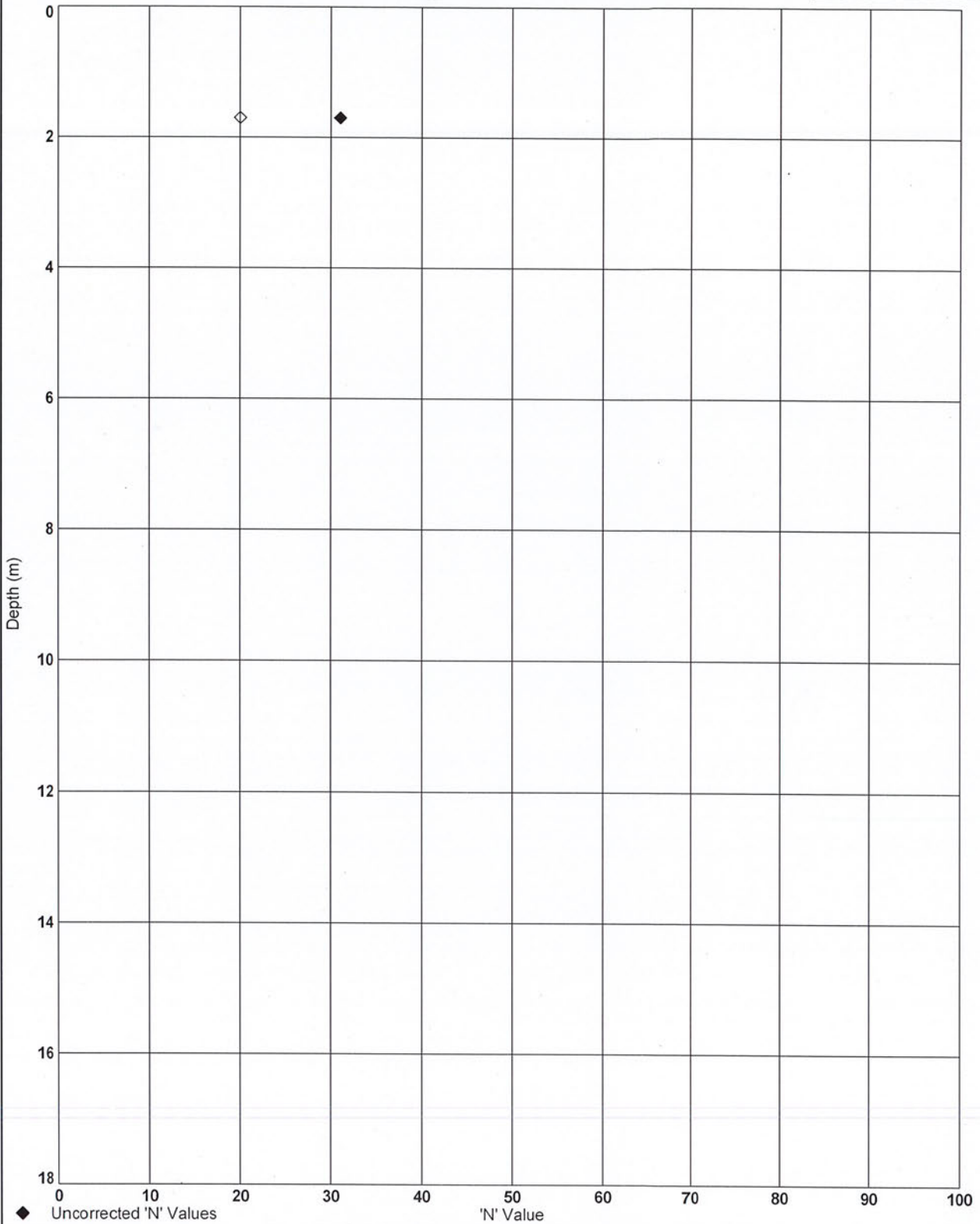
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)



Exploratory Hole No

BH BB003



◆ Uncorrected 'N' Values
 ◇ Corrected 'N' Values
 Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
---	------------------------------

	Date of issue :- 01/09/2021	Certificate No :- SPT/4322C/Graph/BH BB003	Operator :- E. Bacon	
	Checked By [Redacted]		AEG Contract No. :- 4322C	

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office:
Regional Office:

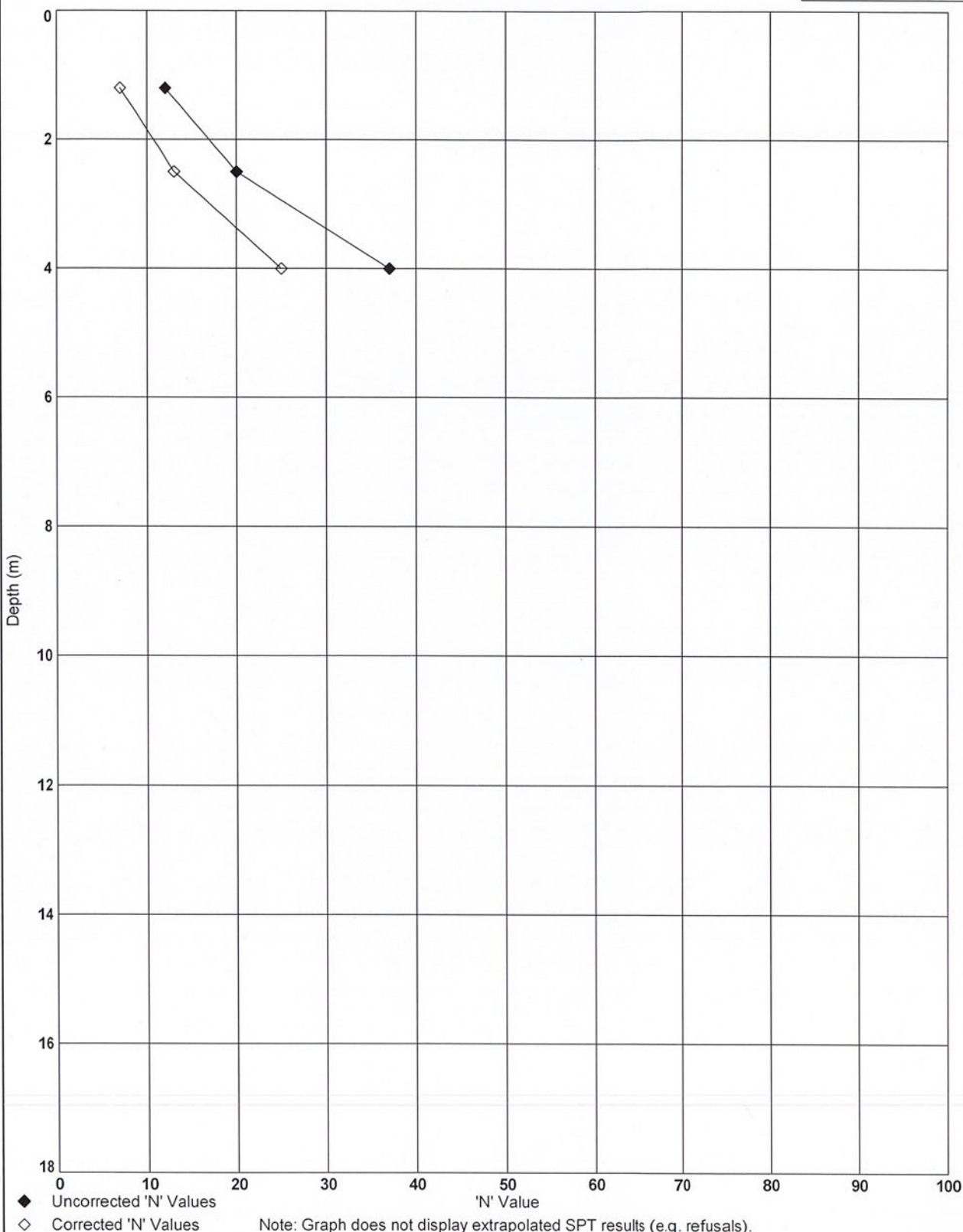
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB004



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited

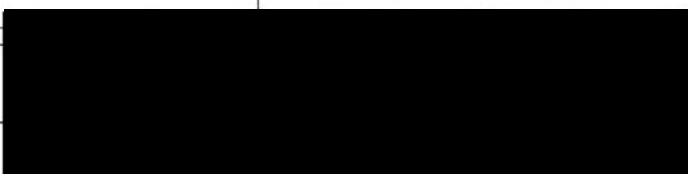


Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB004

Operator :-
L. Selkirk

Checked By :-



AEG Contract No. :-
4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office:
Regional Office:

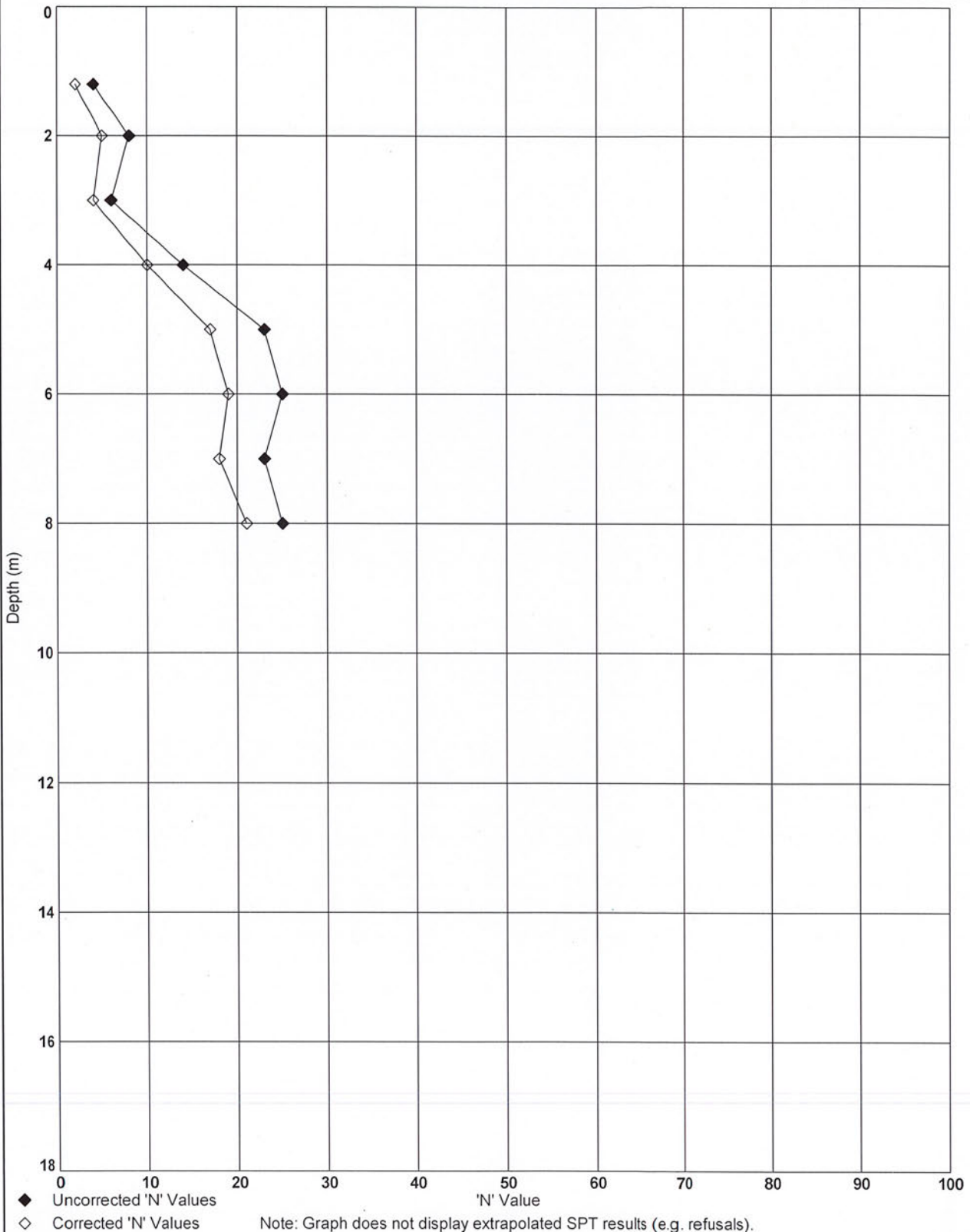
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB005



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited

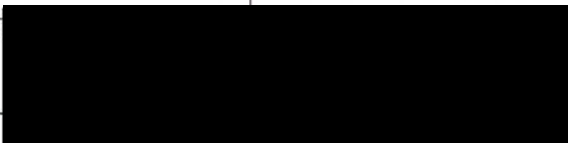


Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB005

Operator :-
L. Selkirk

Checked By :-



AEG Contract No. :-
4322C



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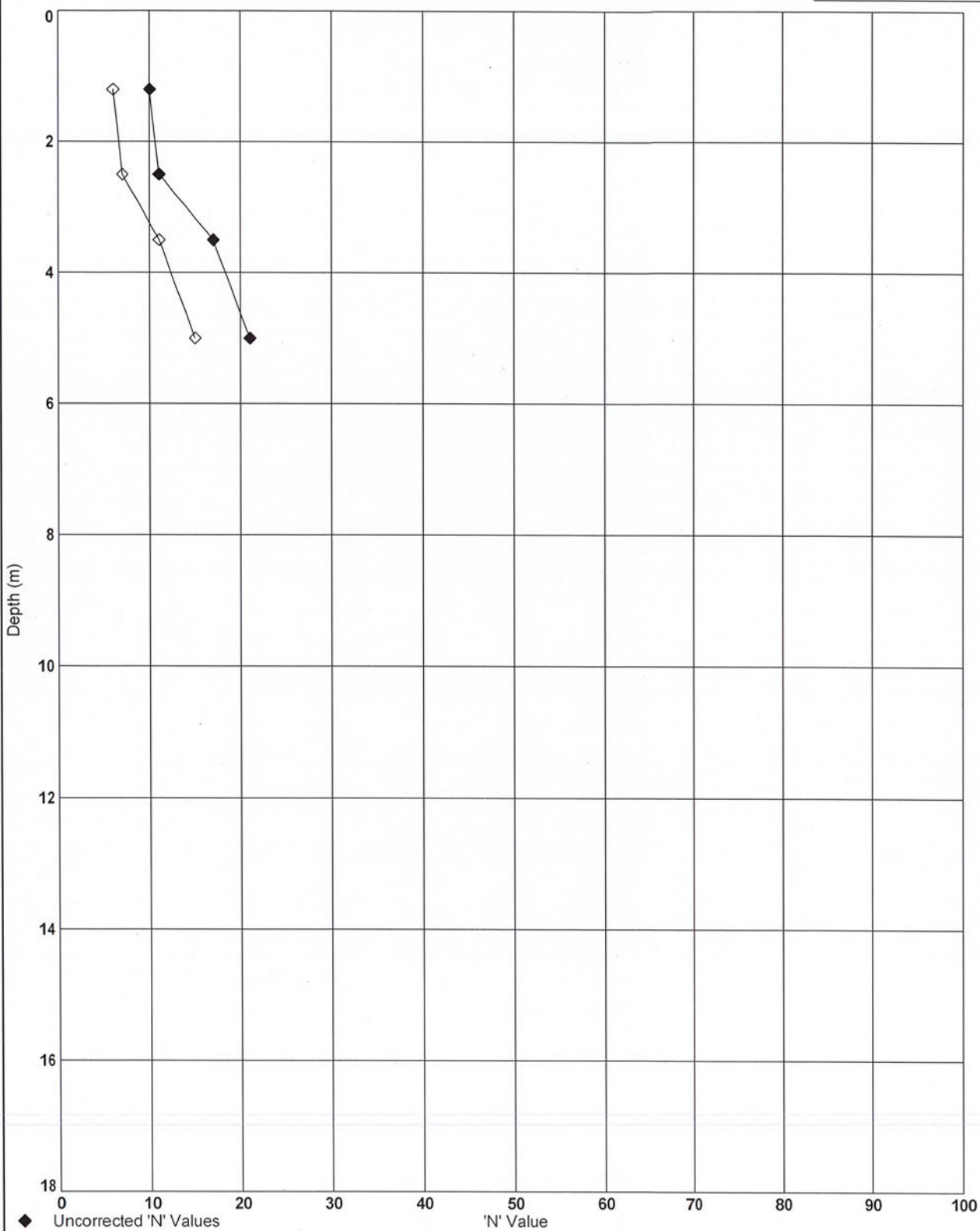
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB006



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited



Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB006

Operator :-
L. Selkirk

Checked By: [Redacted]

AEG Contract No. :-
4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

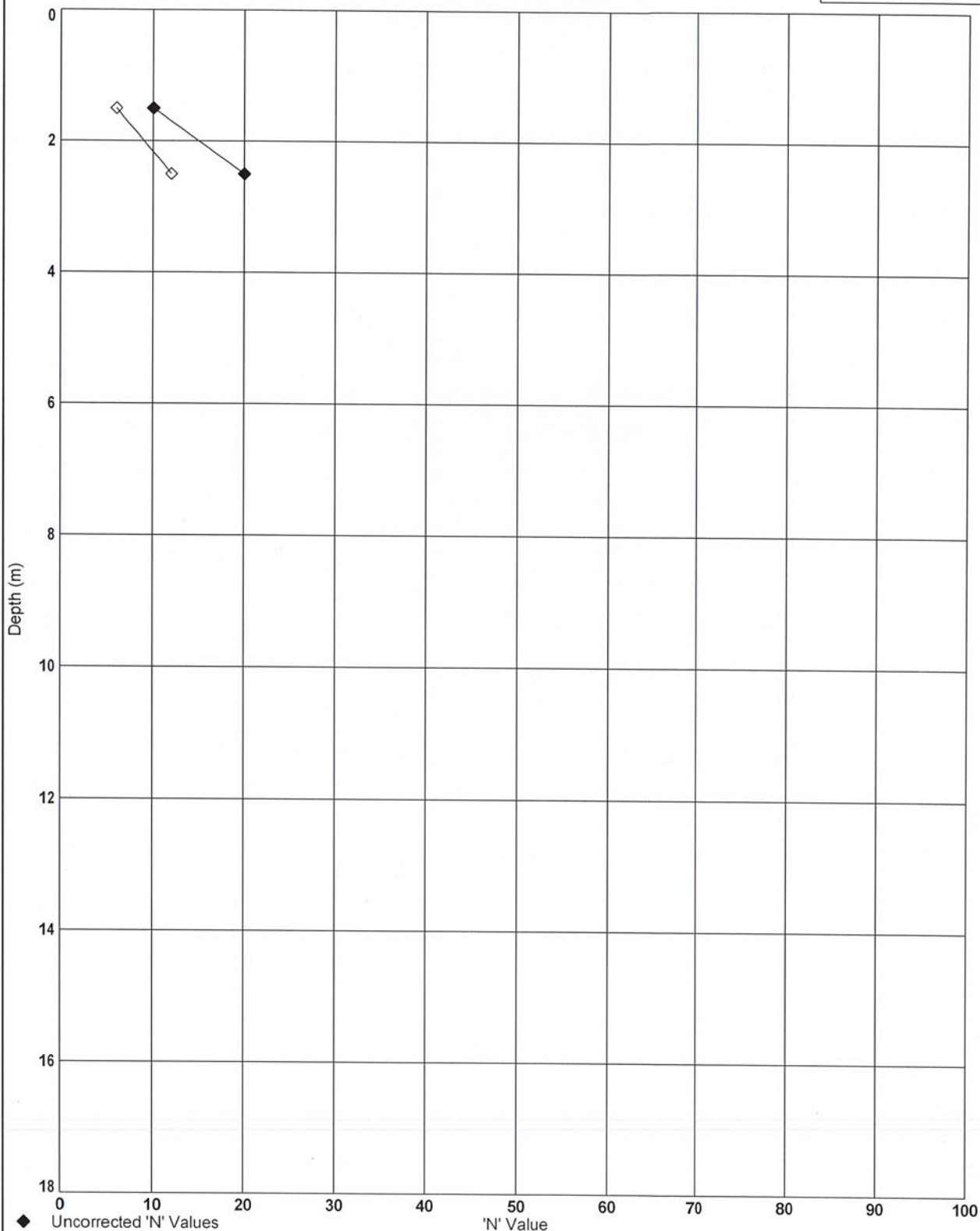
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB007



Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB007

Operator :-
 K.R./L.H.



Checked By :- [Redacted]

AEG Contract No. :-
 4322C

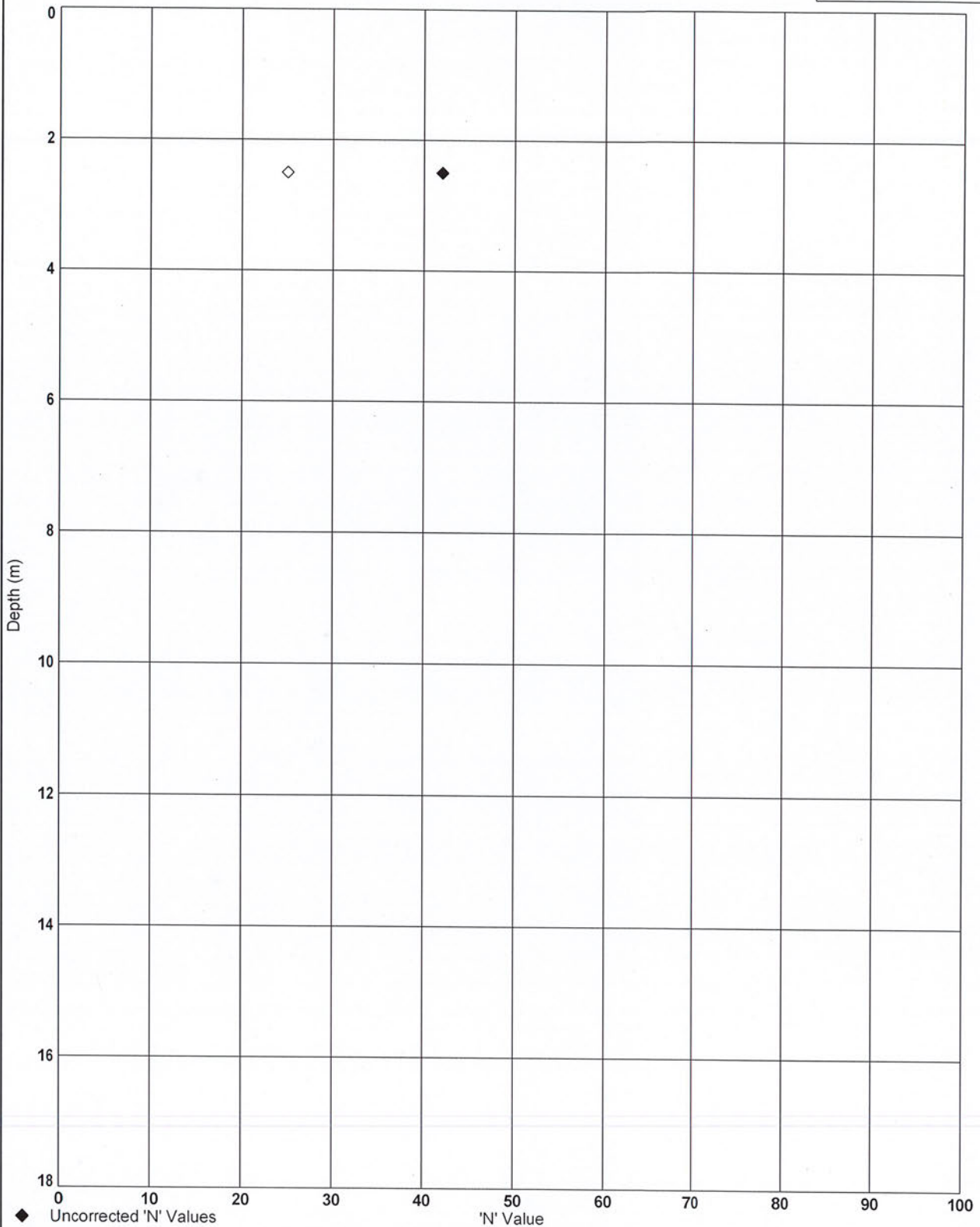
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB008



◆ Uncorrected 'N' Values

◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited



Date of issue :-
01/09/2021

Checked: [Redacted]

Certificate No :-
SPT/4322C/Graph/BH BB008

Operator :-
K.R./L.H.

EG Contract No. :-
4322C



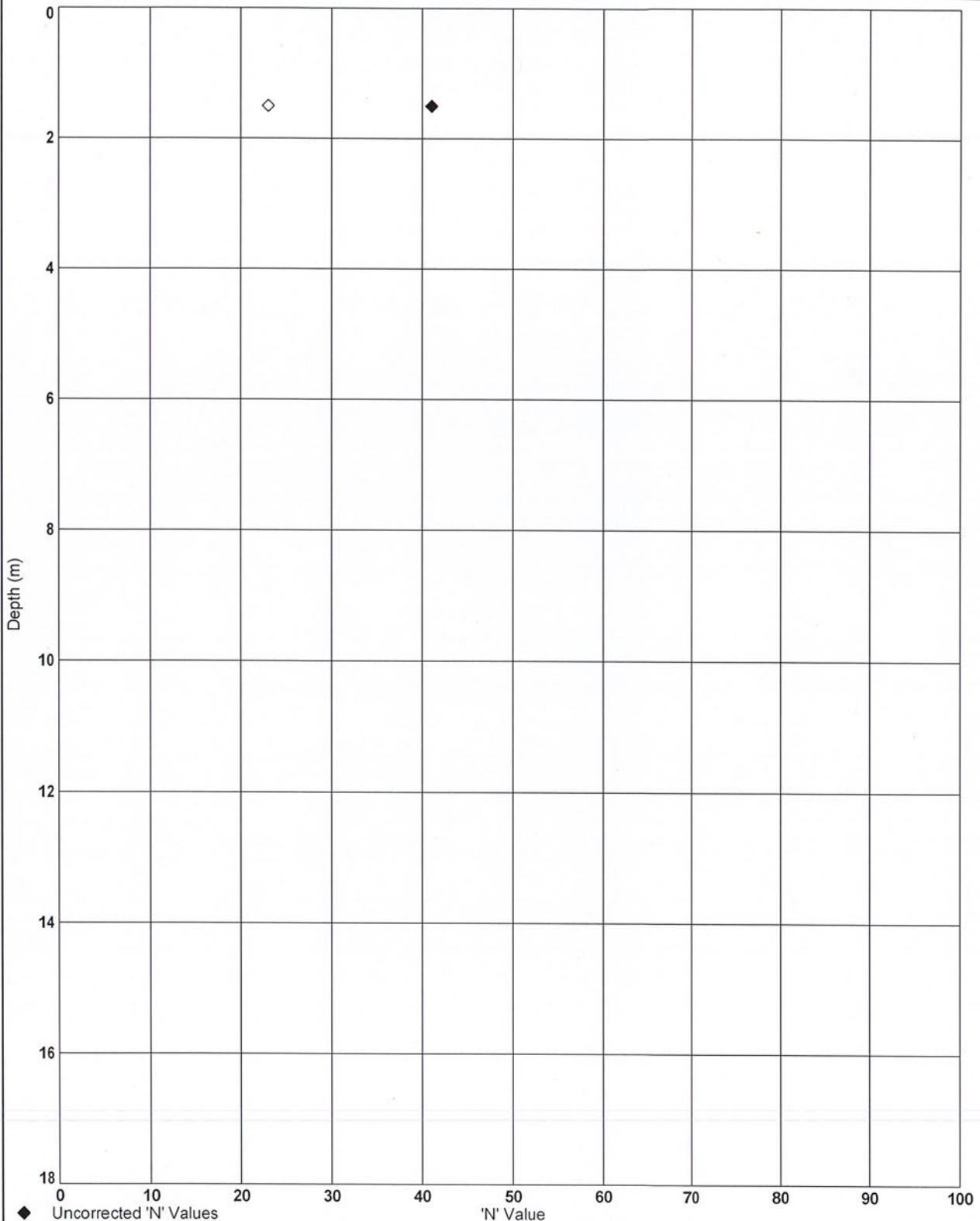
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB009



◆ Uncorrected 'N' Values
 ◇ Corrected 'N' Values
 Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB009

Operator :-
 K.R./L.H.

Checked: [Redacted]

AEG Contract No. :-
 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

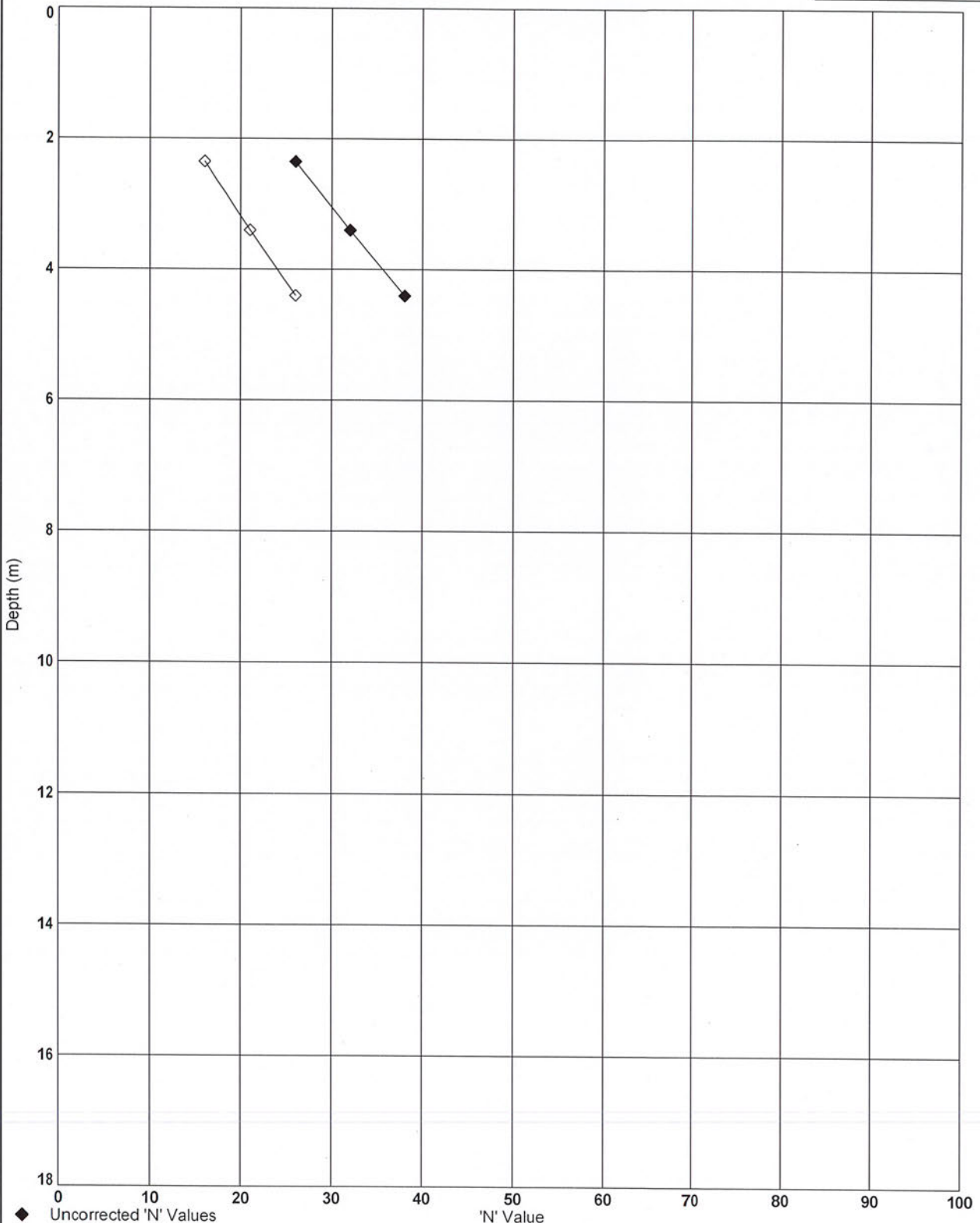
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB013



Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB013

Operator :-
 T. Quinn

Checked By: [Redacted]

AEG Contract No. :-
 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

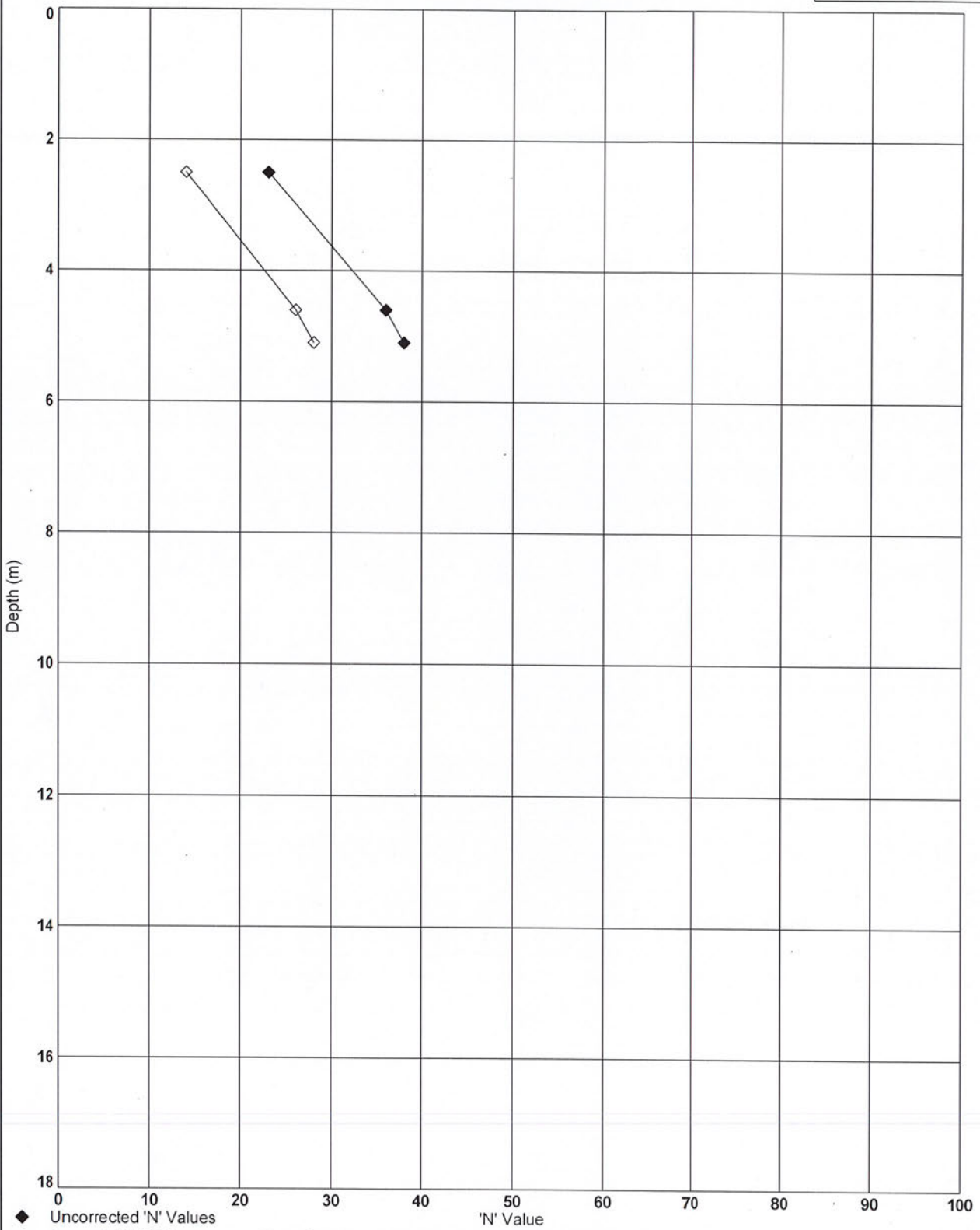
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 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB014



Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB014

Operator :-
 K.R./L.H.

Checked: [Redacted]

EG Contract No. :-
 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

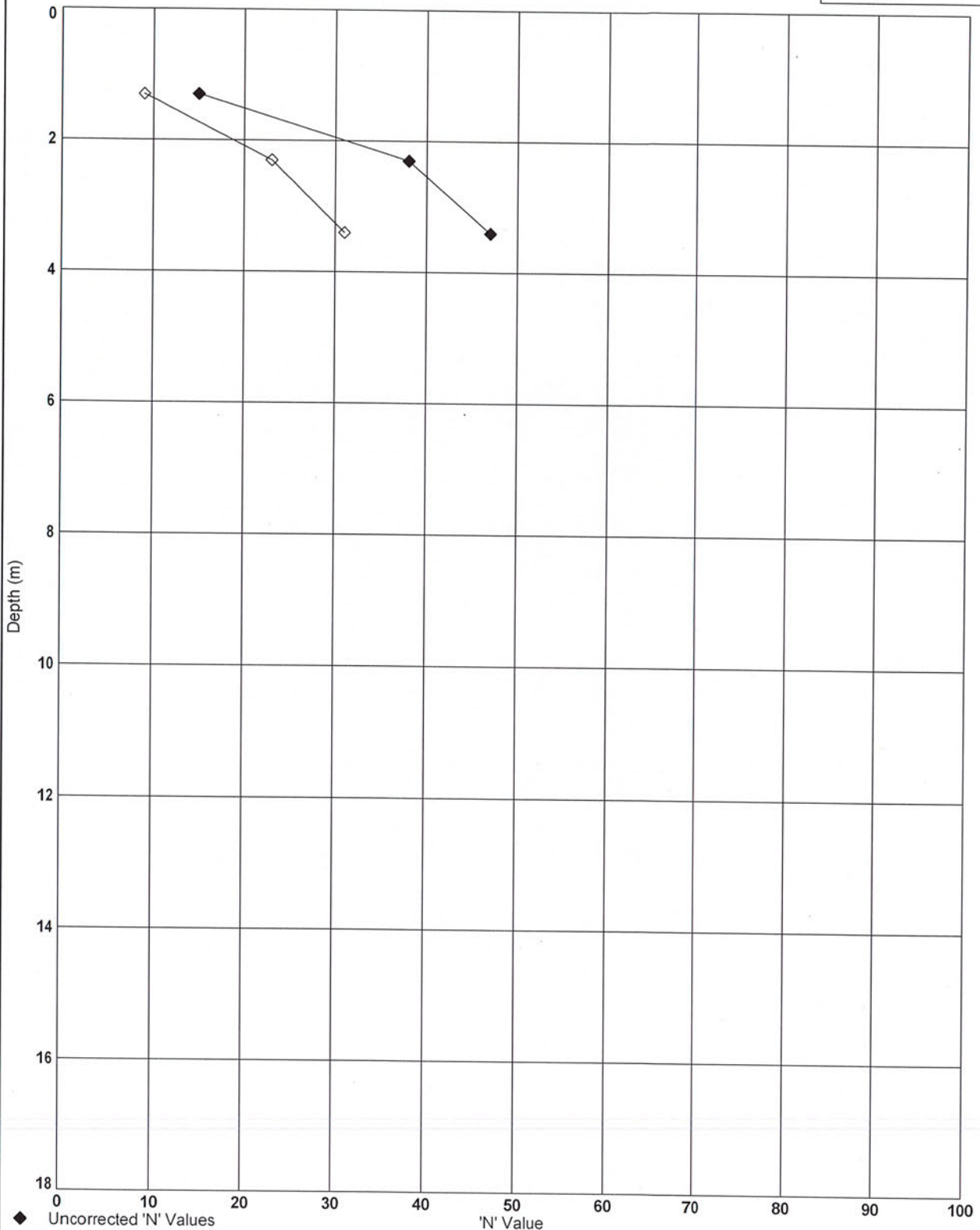
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB015



Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Checked By :-
 [Redacted]

Certificate No :-
 SPT/4322C/Graph/BH BB015

Operator :-
 T. Quinn

AEG Contract No. :-
 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

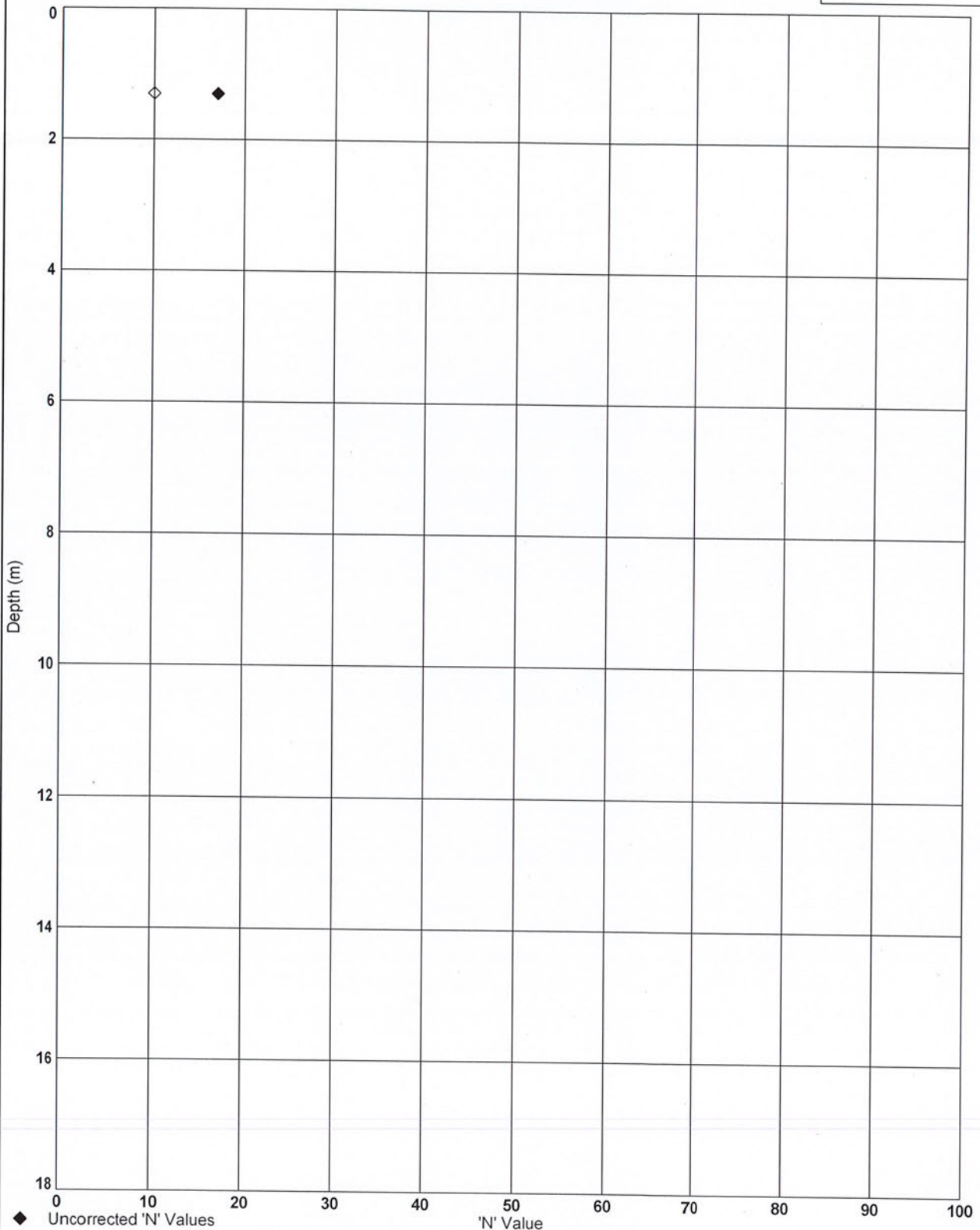
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB016



◆ Uncorrected 'N' Values
 ◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB016

Operator :-
 T. Quinn

Checked By: [Redacted]

AEG Contract No. :-
 4322C



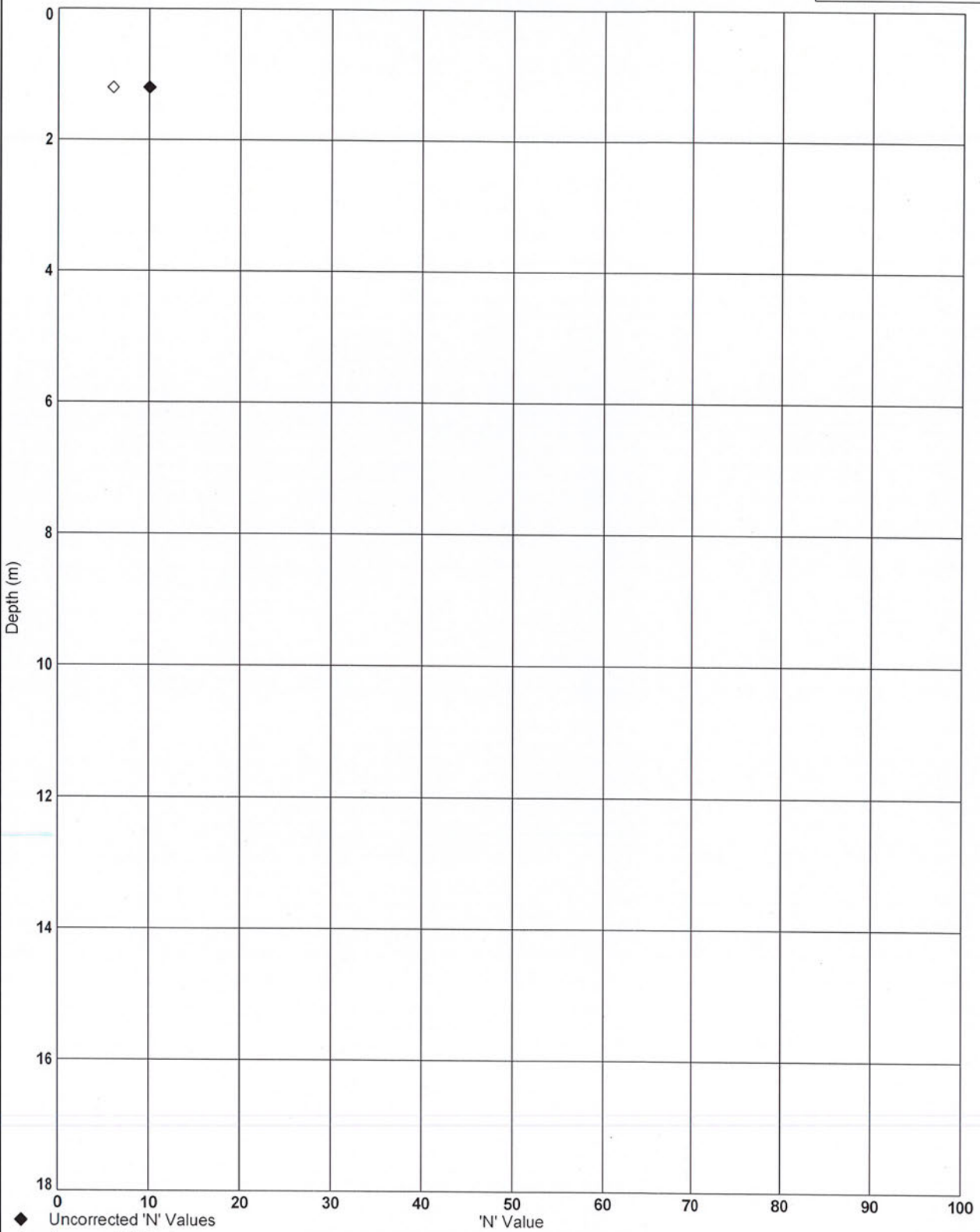
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB019



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited



Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB019

Operator :-
L. Selkirk



Checked: [Redacted]

AEG Contract No. :-
4322C

ALLIED EXPLORATION & GEOTECHNICS LIMITED

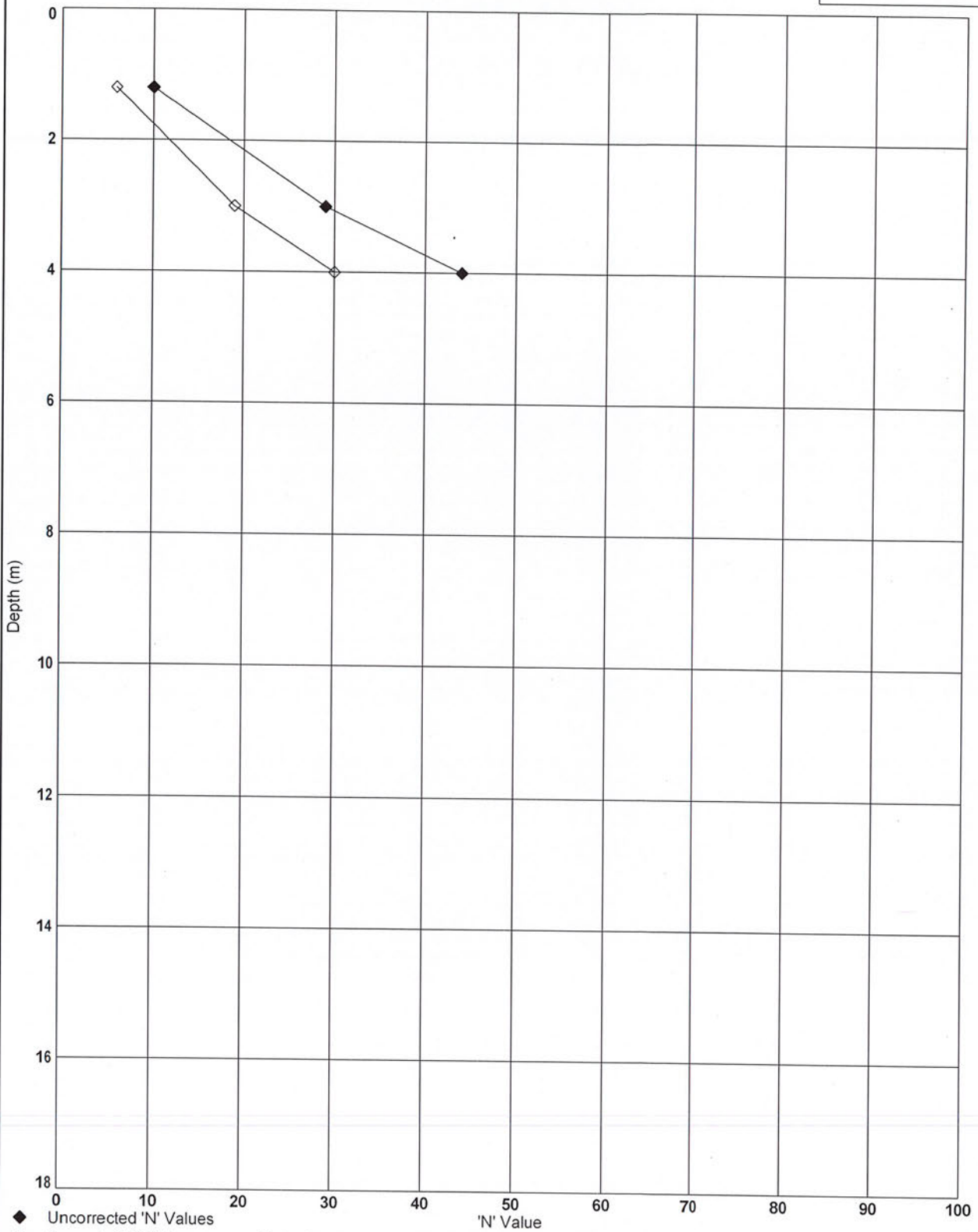
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB020



Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
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	Date of issue :- 01/09/2021	Certificate No :- SPT/4322C/Graph/BH BB020	Operator :- L.S./L.H.
	Checked By: [REDACTED]		AEG Contract No. :- 4322C

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office:
Regional Office:

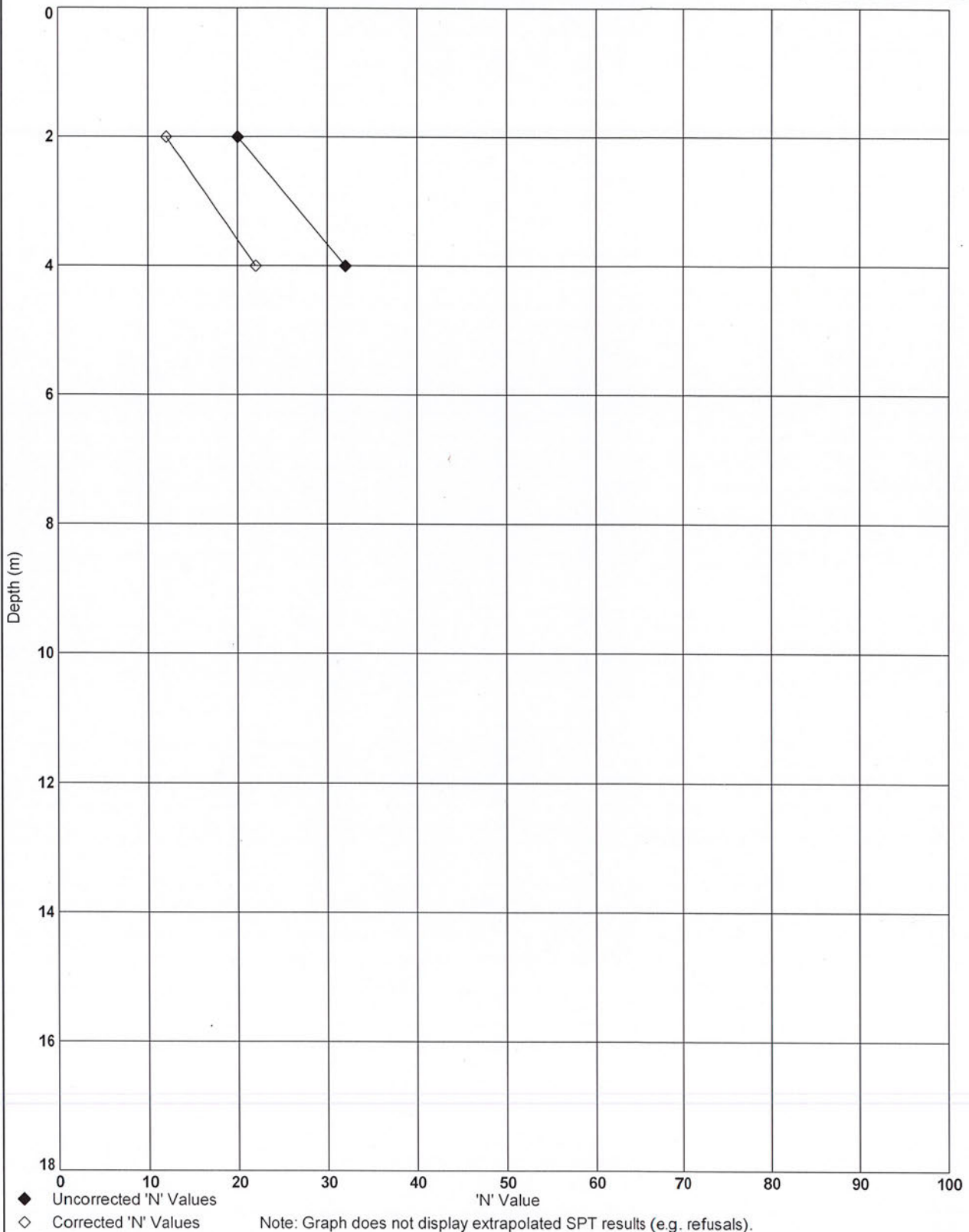
Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB021



Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited

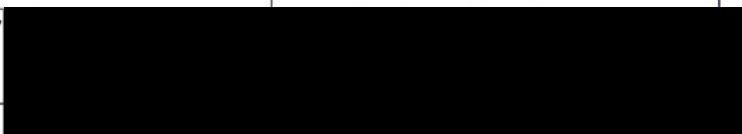


Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB021

Operator :-
L. Selkirk

Checked By



EG Contract No. :-
4322C



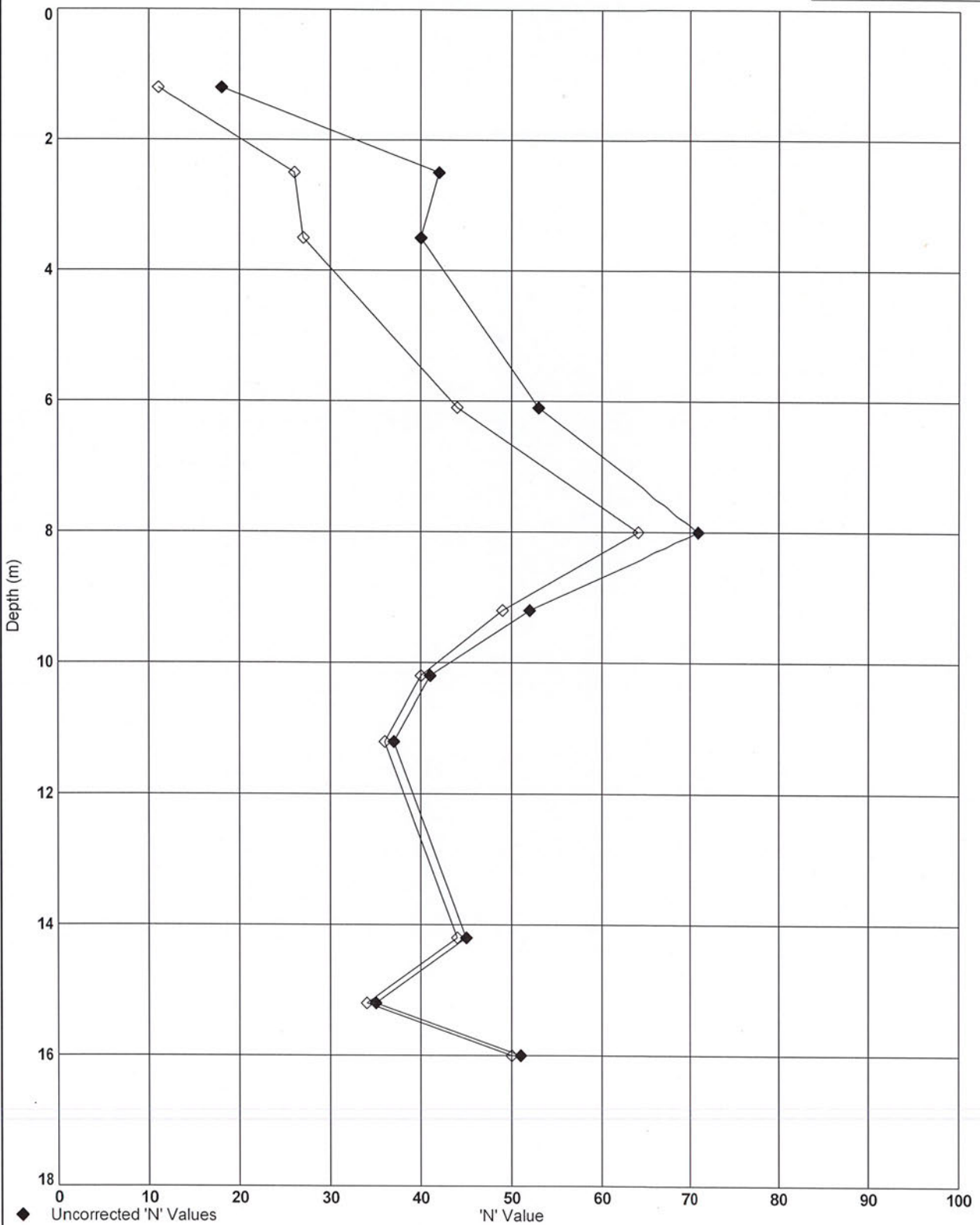
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB023



Contract Title :- A66 North Trans Pennine Scheme D Section 7

Client :- AMEY OW Limited



Date of issue :- 01/09/2021

Certificate No :- SPT/4322C/Graph/BH BB023

Operator :- L.S./E.B.

Checked [Redacted]

AEG Contract No. :- 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

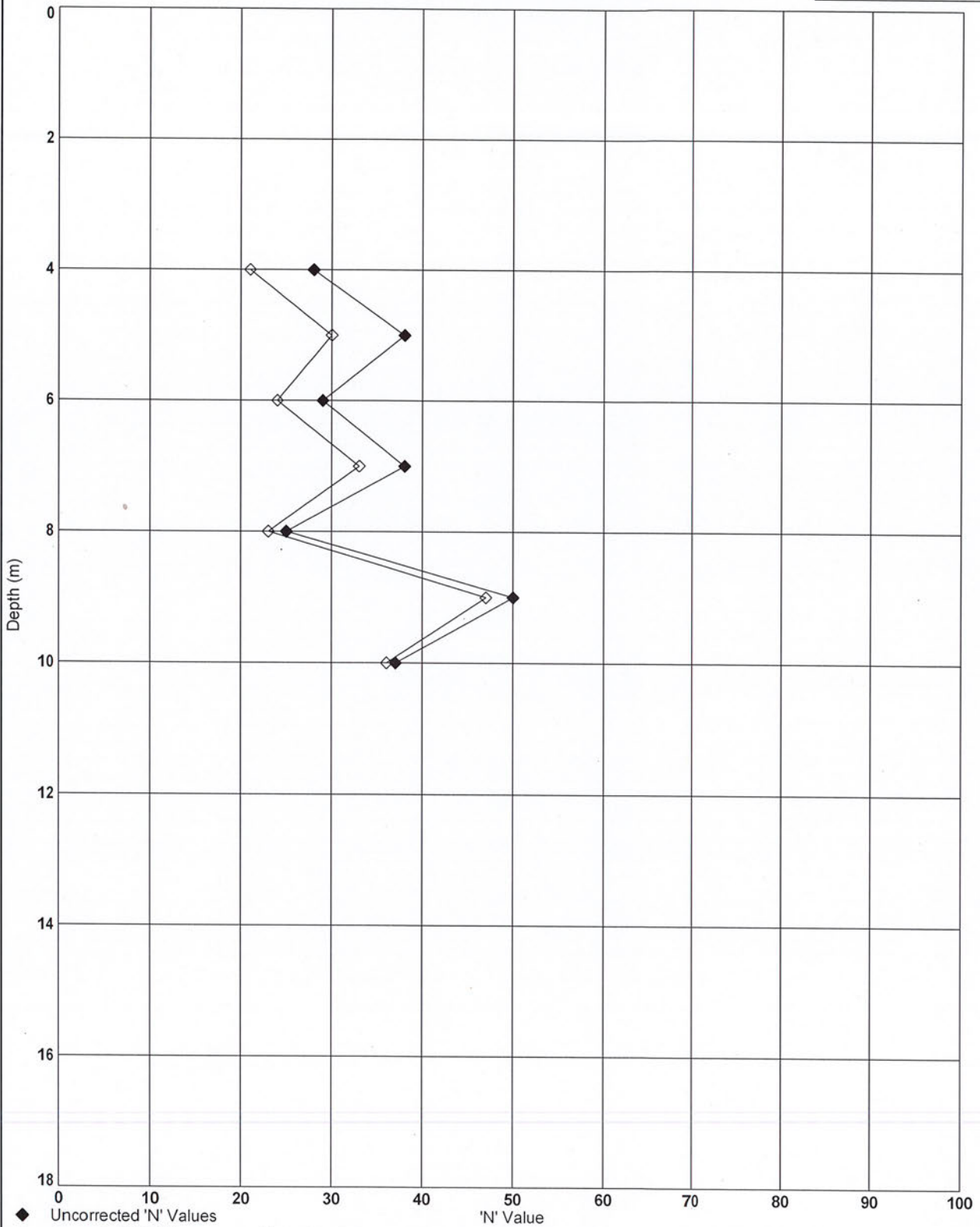
Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
 Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB024



Contract Title :-
 A66 North Trans Pennine Scheme D Section 7

Client :-
 AMEY OW Limited



Date of issue :-
 01/09/2021

Certificate No :-
 SPT/4322C/Graph/BH BB024

Operator :-
 K.R./E.B.

Checked: [Redacted]

AEG Contract No. :-
 4322C



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office:
Regional Office:

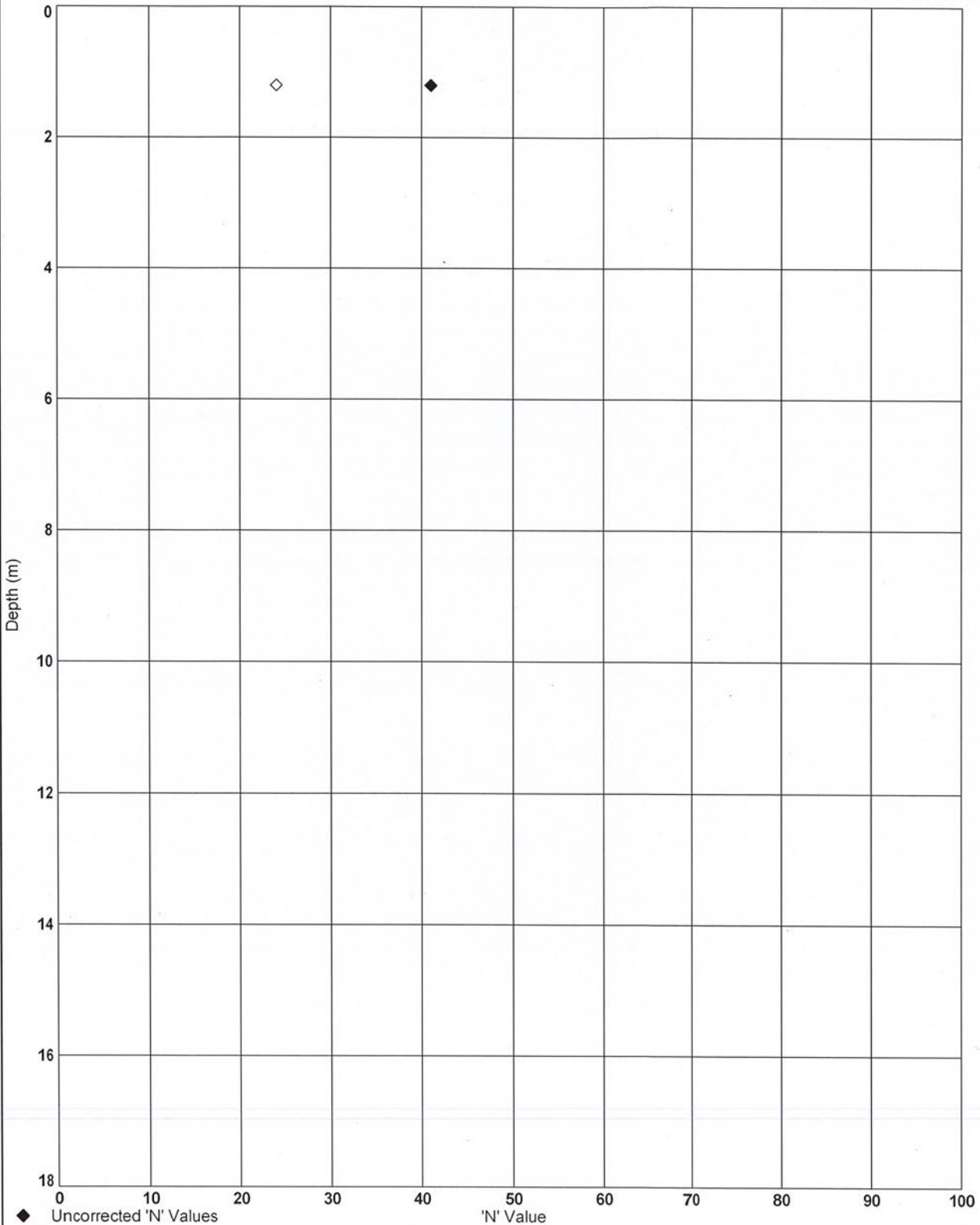
Unit 25 Stella Gill Industrial Estate, Peilton Fell, Chester-le-Street, Co. Durham, DH2 2RG
Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL

Tel: 0191 387 4700 Fax: 0191 387 4710
Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

BH BB026



◆ Uncorrected 'N' Values
◇ Corrected 'N' Values

Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :-
A66 North Trans Pennine Scheme D Section 7

Client :-
AMEY OW Limited

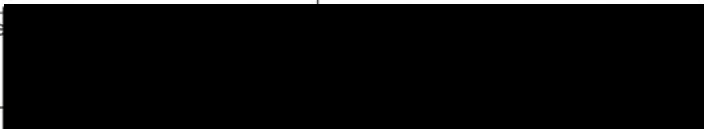


Date of issue :-
01/09/2021

Certificate No :-
SPT/4322C/Graph/BH BB026

Operator :-
L. Selkirk

Checked



AEG Contract No. :-
4322C



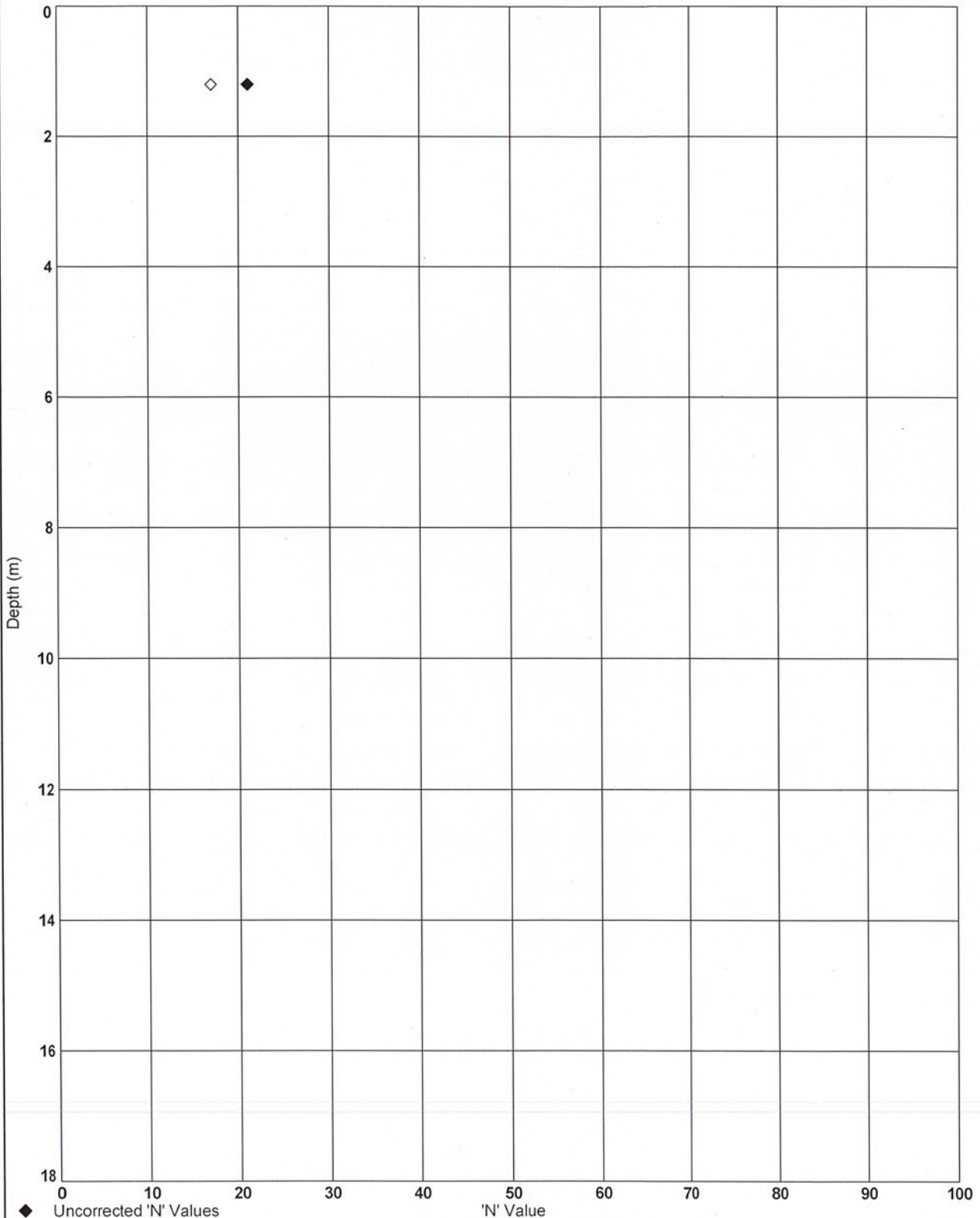
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

WS BB001



◆ Uncorrected 'N' Values ◇ Corrected 'N' Values Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme D Section 7	Client :- AMEY OW Limited
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	Date of issue :- 01/09/2021	Certificate No :- SPT/4322C/Graph/WS BB001	Operator :- E. Bacon
	Check [REDACTED]		AEG Contract No. :- 4322C

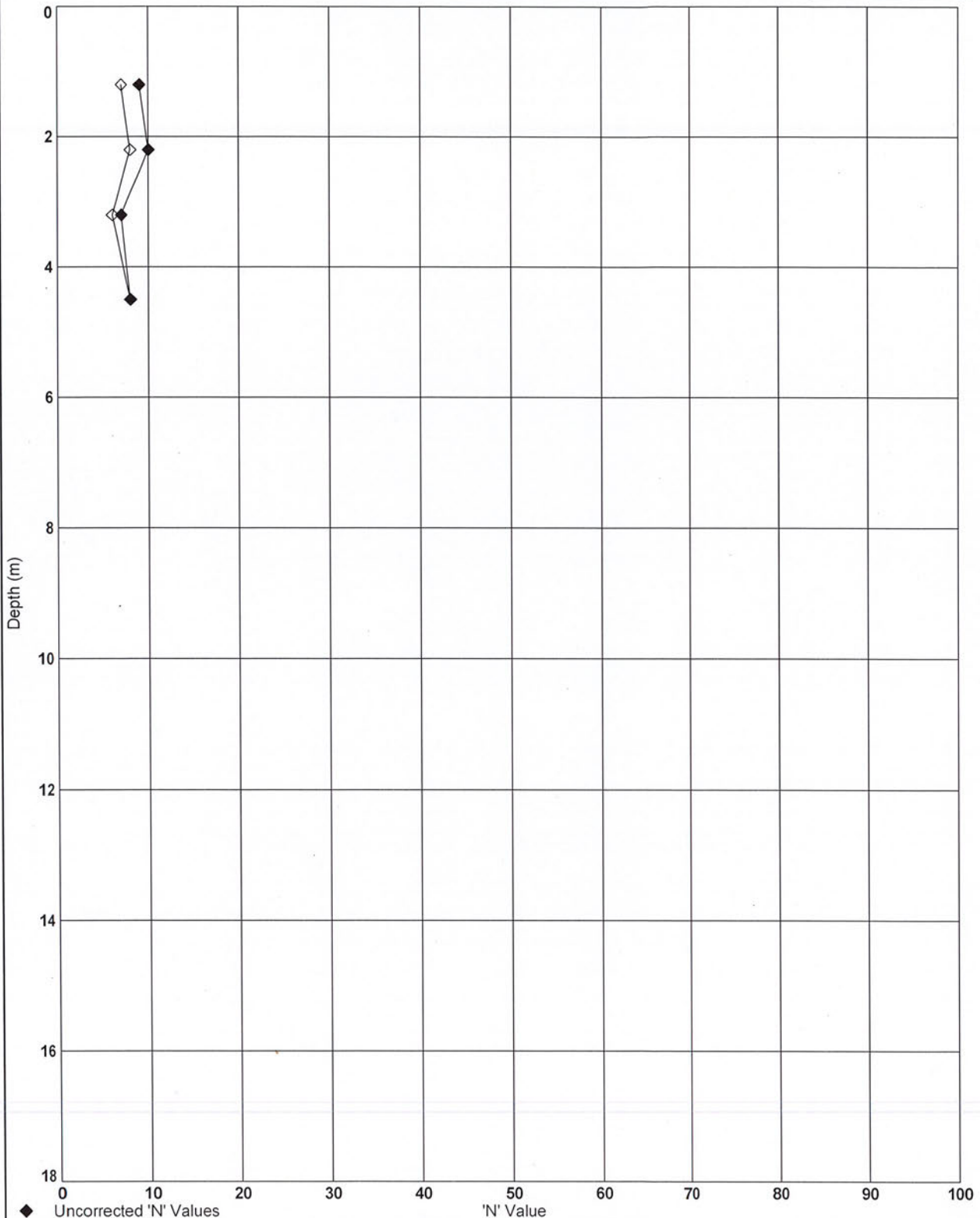
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit 20 Business Development Centre, Eanam Wharf, Blackburn, BB1 5BL Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

WS BB002



◆ Uncorrected 'N' Values
 ◇ Corrected 'N' Values
 Note: Graph does not display extrapolated SPT results (e.g. refusals).

Contract Title :- A66 North Trans Pennine Scheme D Section 7
 Client :- AMEY OW Limited

	Date of issue :- 01/09/2021	Certificate No :- SPT/4322C/Graph/WS BB002	Operator :- L. Selkirk	
	Checked By: [Redacted]		AEG Contract No. :- 4322C	

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: ATH05
Test Date: 02/07/2020
Report Date: 03/07/2020
File Name: ATH05.sp
Test Operator: BP

QUALITY CONTROL
CHECKED
03 AUG 2020

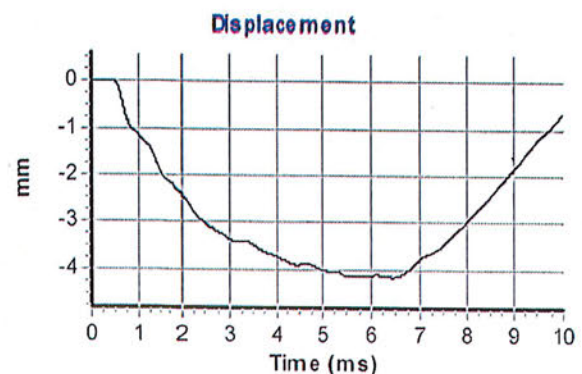
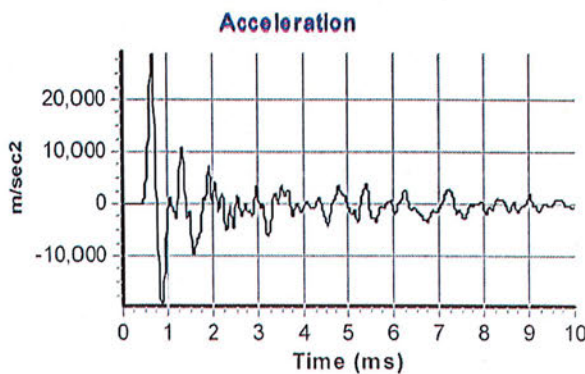
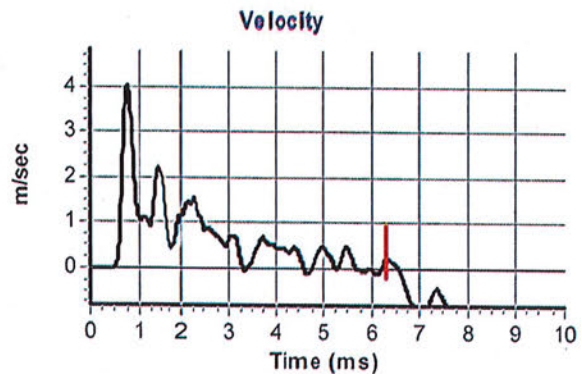
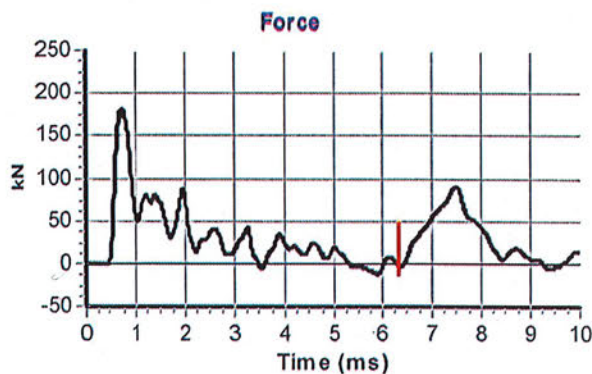
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11948
Accelerometer No.2: 6469

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 755
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm²): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 279

Energy Ratio E_r (%): **59**

Signed: Brian Proctor
Title: Senior Technician

The recommended calibration interval is 12 months

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: ATH06
Test Date: 02/07/2020
Report Date: 03/07/2020
File Name: ATH06.spt
Test Operator: BP

QUALITY CONTROL
CHECKED
03 AUG 2020

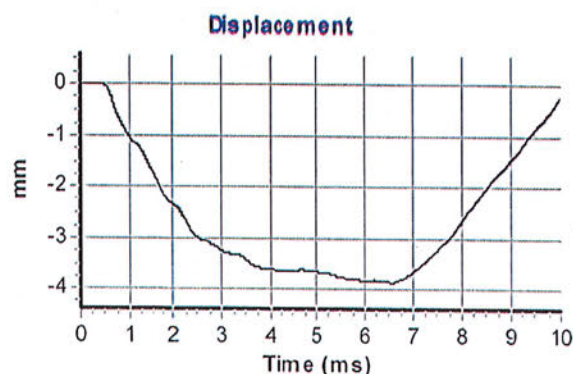
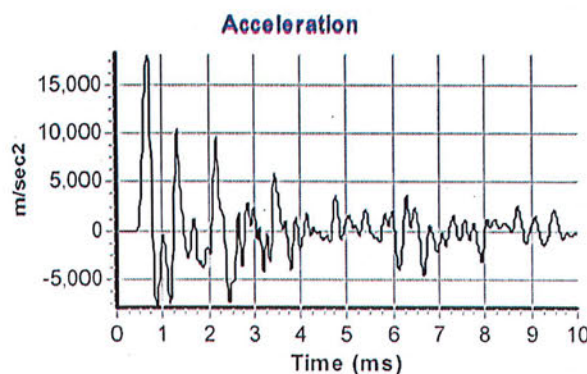
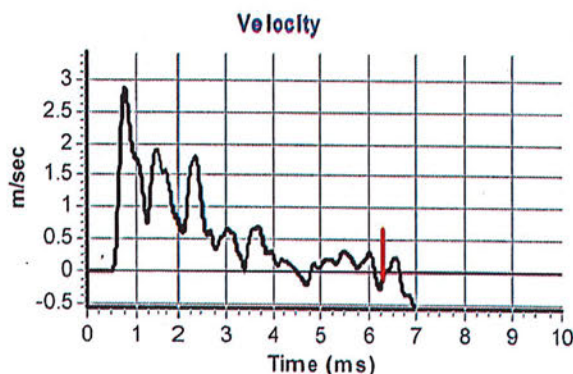
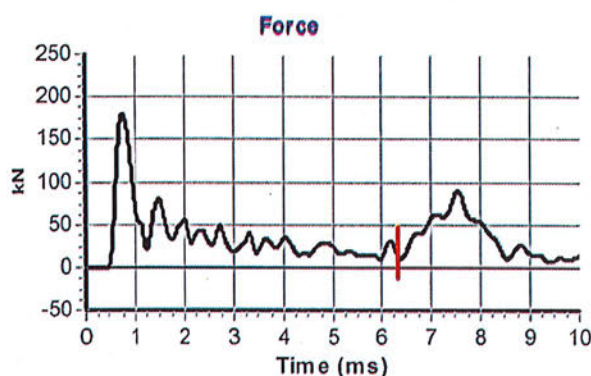
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11948
Accelerometer No.2: 6469

SPT Hammer Information

Hammer Mass m (kg): 63.4
Falling Height h (mm): 762
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm^2): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 240

Energy Ratio E_r (%): **51**

Signed: Brian Proctor
Title: Senior Technician

The recommended calibration interval is 12 months

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: ATH07
Test Date: 06/02/2021
Report Date: 08/02/2021
File Name: ATH07.spt
Test Operator: BP

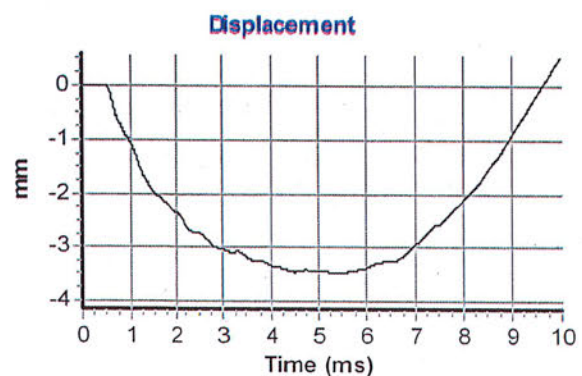
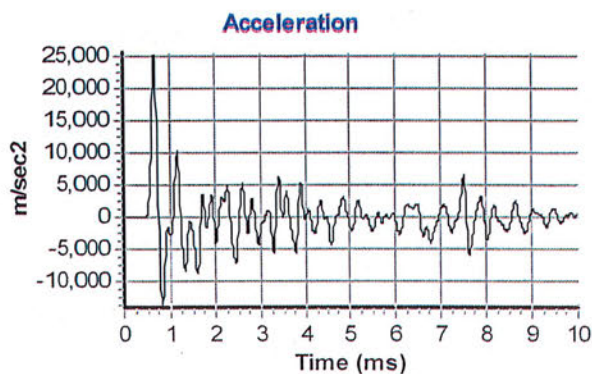
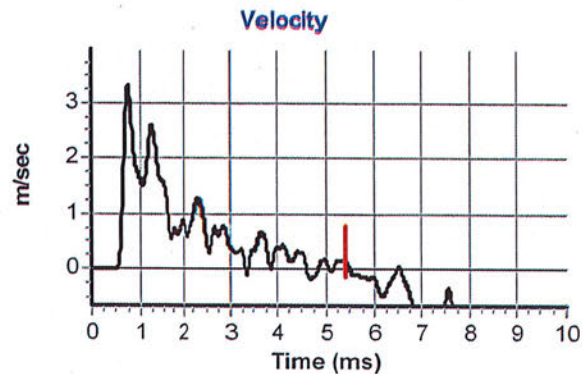
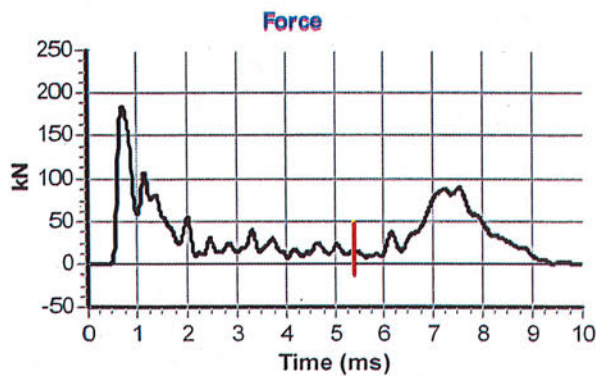
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 65939
Accelerometer No.2: 66286

SPT Hammer Information

Hammer Mass m (kg): 63.2
Falling Height h (mm): 760
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm^2): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 256

Energy Ratio E_r (%): 54

Signed: Brian Proctor
Title: Senior Technician

The recommended calibration interval is 12 months

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: ATH09
Test Date: 14/07/2020
Report Date: 14/07/2020
File Name: ATH09.sp
Test Operator: BP

QUALITY CONTROL
CHECKED
03 AUG 2020

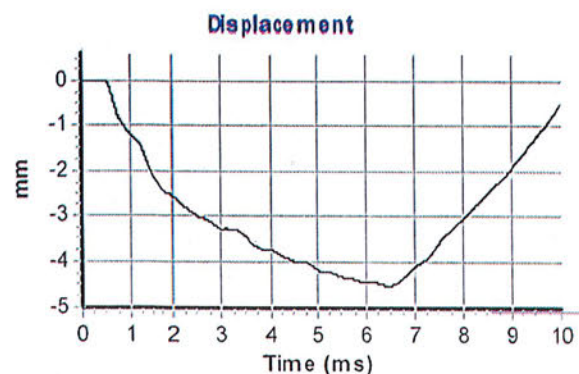
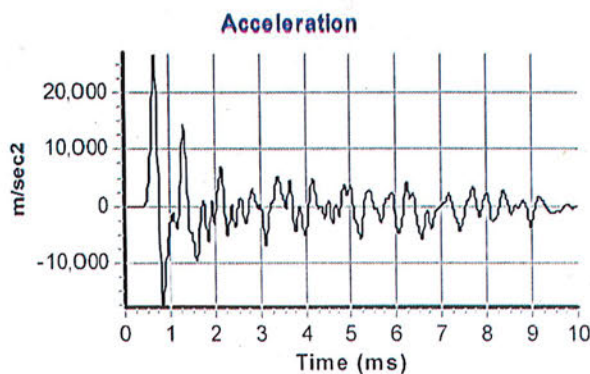
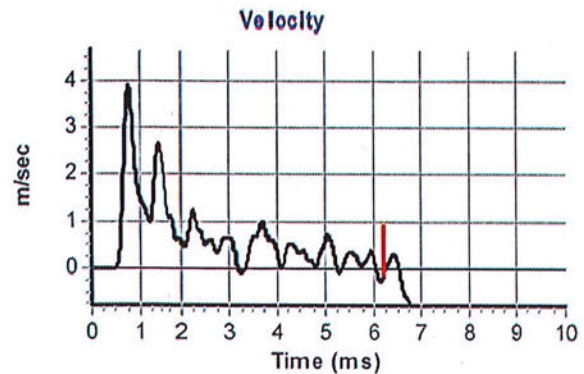
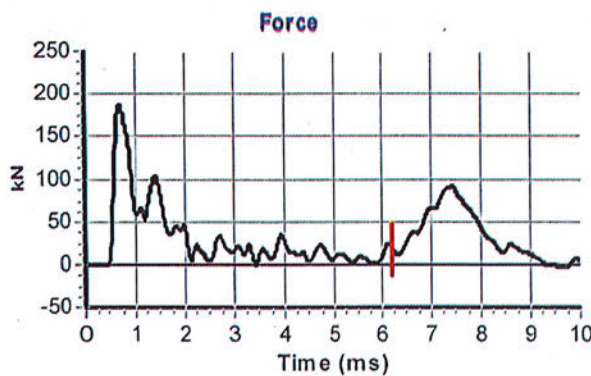
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11948
Accelerometer No.2: 6469

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm²): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 259

Energy Ratio E_r (%): **55**

Signature: [Redacted]
Title: Senior Technician

The recommended calibration interval is 12 months

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: DP04
Test Date: 08/07/2020
Report Date: 14/07/2020
File Name: DP04.sp
Test Operator: BP

QUALITY CONTROL
CHECKED

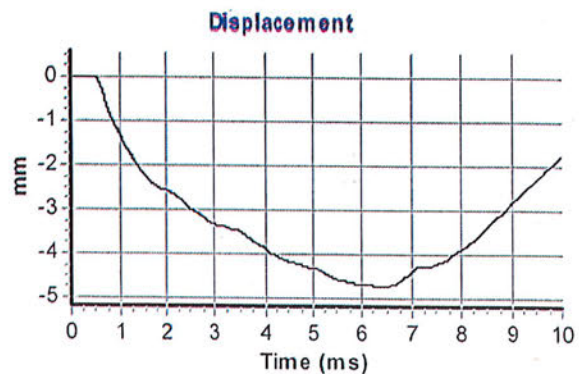
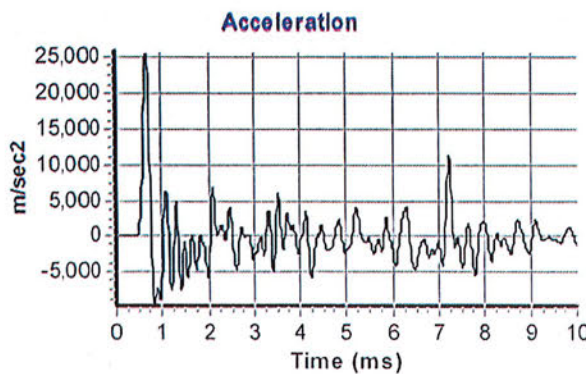
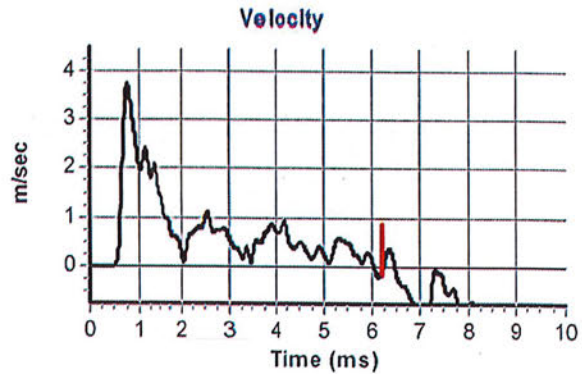
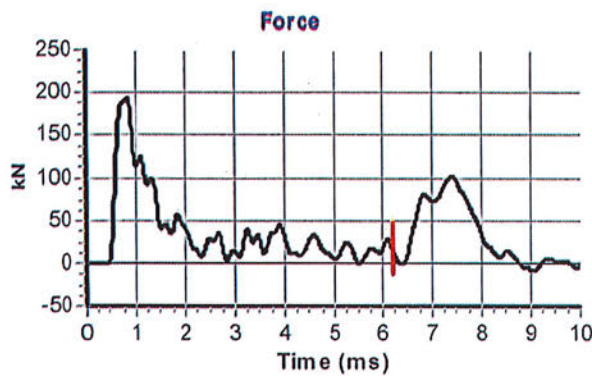
Instrumented Rod Data

Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 11948
Accelerometer No.2: 6469

SPT Hammer Information

Hammer Mass m (kg): 63
Falling Height h (mm): 760
SPT String Length L (m): 14.1

Comments / Location



Calculations

Area of Rod A (mm^2): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 346

Energy Ratio E_r (%): 73

Signed: Brian Proctor

Title: Senior Technician

The recommended calibration interval is 12 months

Unit 25 Stella Gill Industrial Estate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Ref: TQ2
Test Date: 22/12/2020
Report Date: 22/12/2020
File Name: TQ2.spt
Test Operator: BP

Instrumented Rod Data

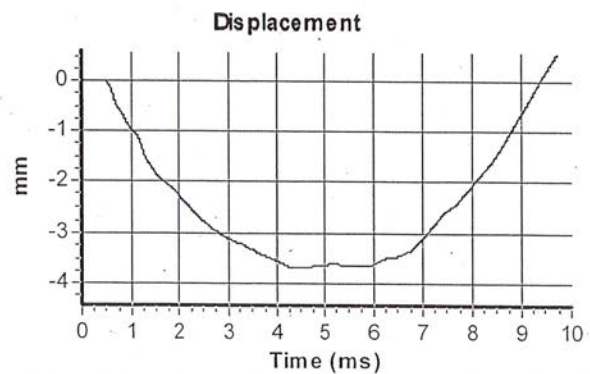
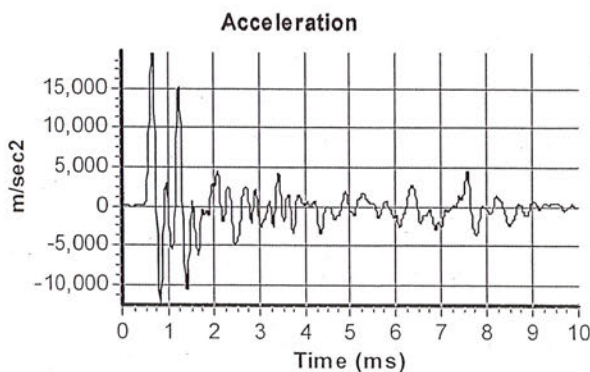
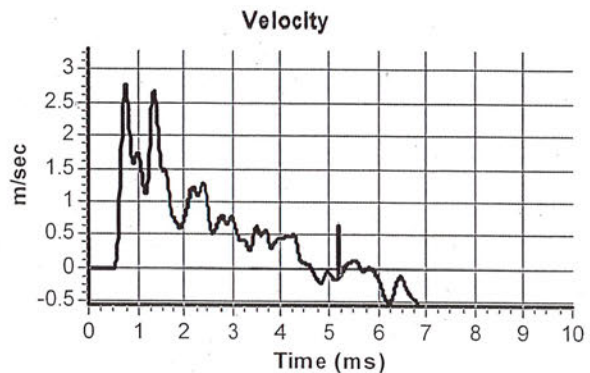
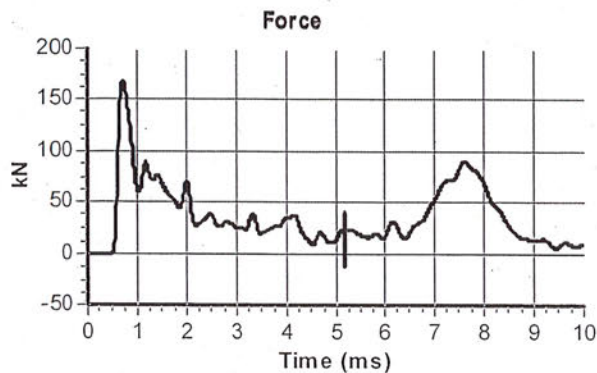
Diameter d_r (mm): 67
Wall Thickness t_r (mm): 8.8
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 65939
Accelerometer No.2: 66286

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.1

Comments / Location

Mass and drop supplied by client



Calculations

Area of Rod A (mm^2): 1609
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 250

Energy Ratio E_r (%): 53

Signed: Brian Proctor
Title: Senior Technician

The recommended calibration interval is 12 months