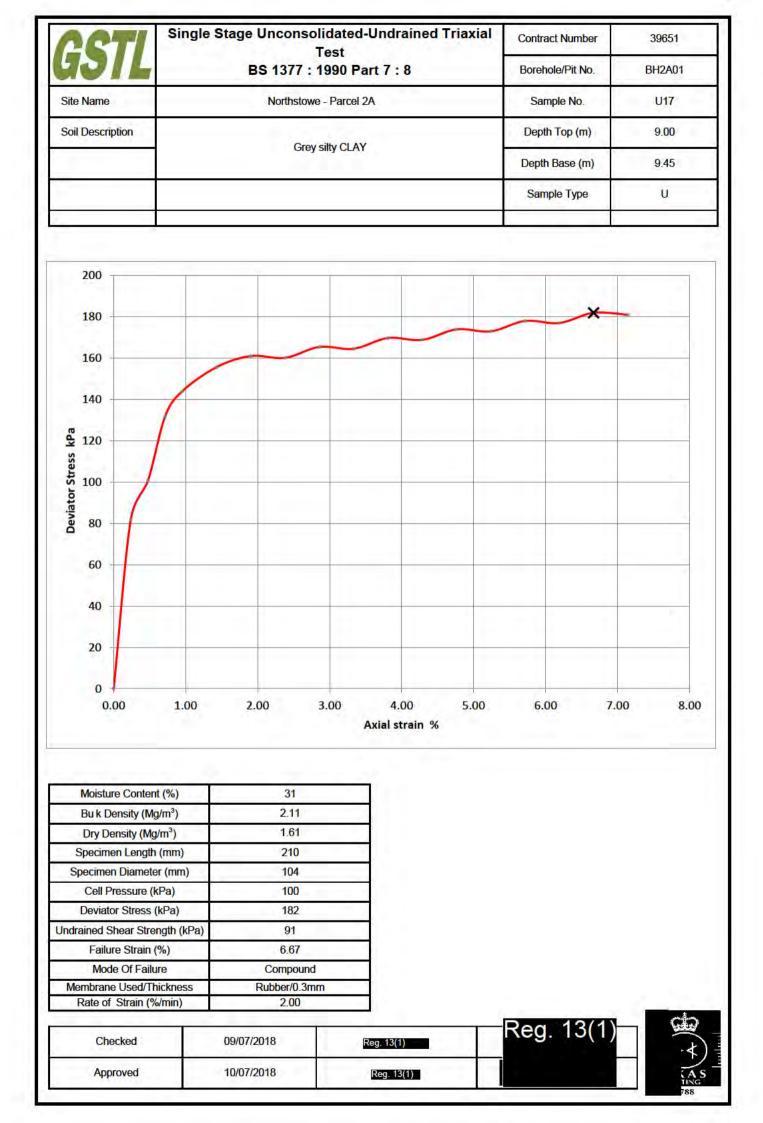


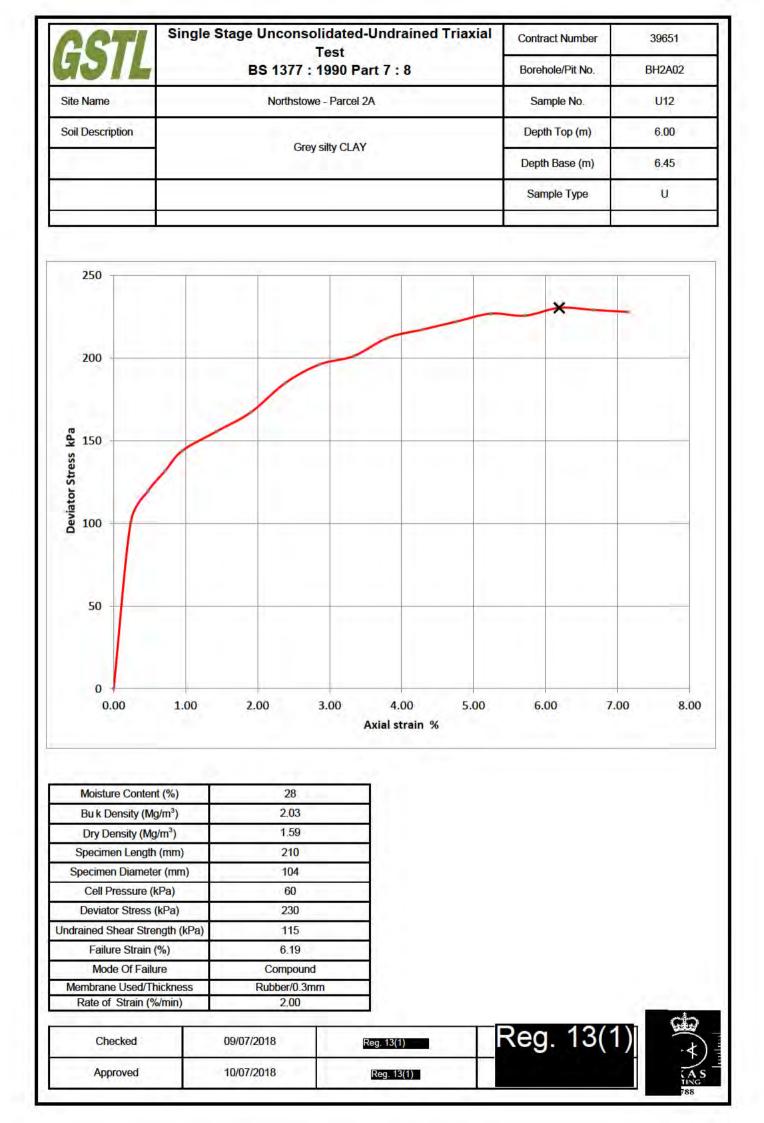
P	GTI	Single		dated-Undrained Tria	axial	Contract Number	39651
5	OIL			90 Part 7 : 8		Borehole/Pit No.	BH2A01
Site	Name		Northstowe -	Parcel 2A	]	Sample No.	5
Soil	Description					Depth Top (m)	2.00
			Grey slighti	y silty CLAY	1	Depth Base (m)	2.45
					—j	Sample Type	U
	100						
	90						
					-		
	80						
	70	_	T				
_			$\sim$				
Deviator Stress kPa	60	1					
tress		/					
or St	50						
viat	40						
ă	40						
	30						
	-						
	20						
	10	_					
	10						
	0						
	0.00	2.	00 4.00	6.00 Axial strain %	8.00	10.00	12.0
. 1	Moisture Conte	ent (%)	26				
	Buk Density (M	/lg/m <sup>3</sup> )	1.96				
	Dry Density (M		1.55				
-	Specimen Lengt pecimen Diame		210 102				
- St	Cell Pressure	10200	40				
0	Deviator Stress		87				
Indra	ained Shear Str	ength (kPa)	43				
	Failure Strain	(%)	10.48				
	Mode Of Fai	and a second	Plastic				
	embrane Used/ Rate of Strain (		Rubber/0.3mm 2.00				
	- 30.00	T	en Chen Ch		TR	eg. 13(1	
	Checked		08/07/2018	Reg. 13(1)		<u>bg. 10(1</u>	
_	Approved		09/07/2018	Reg. 13(1)			

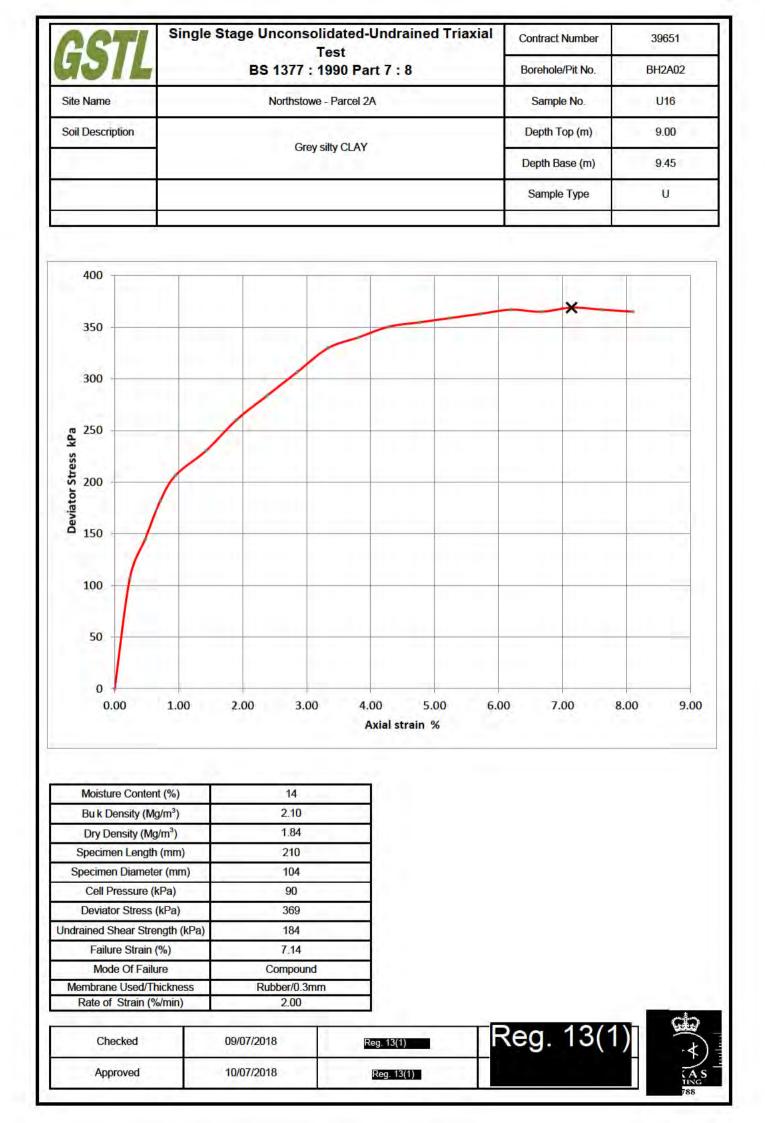
GSTL	Single	Stage Unconsolio Te	dated-Undrai est	ned Triaxial	Contract Nu		39651
AVIL		BS 1377 : 19	90 Part 7 : 8		Borehole/Pi	t No.	BH2A01
Site Name		Northstowe -	Parcel 2A		Sample N	lo.	9
Soil Description		Orau ail	ty CLAY		Depth Top	(m)	4.00
		Grey SI	U OLAT		Depth Base	e (m)	4.45
					Sample Ty	ype	U
300	1	Î		1		Ĩ	
250	-						
			- 11				
					-		
200	-		-	-			_
Deviator Stress kPa	1.1						
ress	/						
5 150	-						
viato							
De							
100	-	-					
50	-						
0							
0.00	1.00	2.00 3.00	4.00 Axial stra		00 7.00	8.00	9.00
Moisture Content	(%)	29					
Bu k Density (Mg	10 000	2.06					
Dry Density (Mg/		1.60					
Specimen Length		210					
Specimen Diameter	r (mm)	104					
Cell Pressure (k		60					
Deviator Stress (I		243					
Indrained Shear Strer		121					
Failure Strain ( Mode Of Failur		8.10					
Mode Of Failu		Compound Rubber/0.3mm					
		2.00					1
Membrane Used/The Rate of Strain (%						in the second se	milion
Membrane Used/Thi	T	08/07/2018	Reg. 13(1)		Reg. 1	3(1)	

<b>GST</b>	Single	Stage Unconsolic Te	lated-Undrained Tria	axial <sub>Con</sub>	tract Number	39651
	L	BS 1377 : 19		Bor	ehole/Pit No.	BH2A01
Site Name	T.,	Northstowe -	Parcel 2A	S	ample No.	13
Soil Description	1			De	pth Top (m)	6.00
		Grey silt	y CLAY	Dep	oth Base (m)	6.45
				Sa	ample Type	U
160		1				1
140						
120						
5.00	~					
g 100	/					-
00 peviator Stress kPa					1 I	
80						
ator						
evia						
<sup>−</sup> 60 <sup>−</sup>						
40				-	-	
20				-	_	
0						
0.00	1.00	2.00 3.00	4.00 5.00 Axial strain %	6.00	7.00	8.00 9.00
Moisture C	content (%)	29				
Bu k Densi		2.09				
Dry Densit		1.62				
Specimen L		180				
Specimen Dia		104	- 70			
Cell Press		80				
Deviator St	tress (kPa) r Strength (kPa)	141 70				
muraneu Snea		6.67				
		Compound				
Failure S Mode Of	the second se	Rubber/0_3mm				
Failure S Mode Of Membrane Us		0.00				1 . T
Failure S Mode Of		2.00				
Failure S Mode Of Membrane Us	ain (%/min)	08/07/2018	Reg. 13(1)	Reg	g. 13(1	



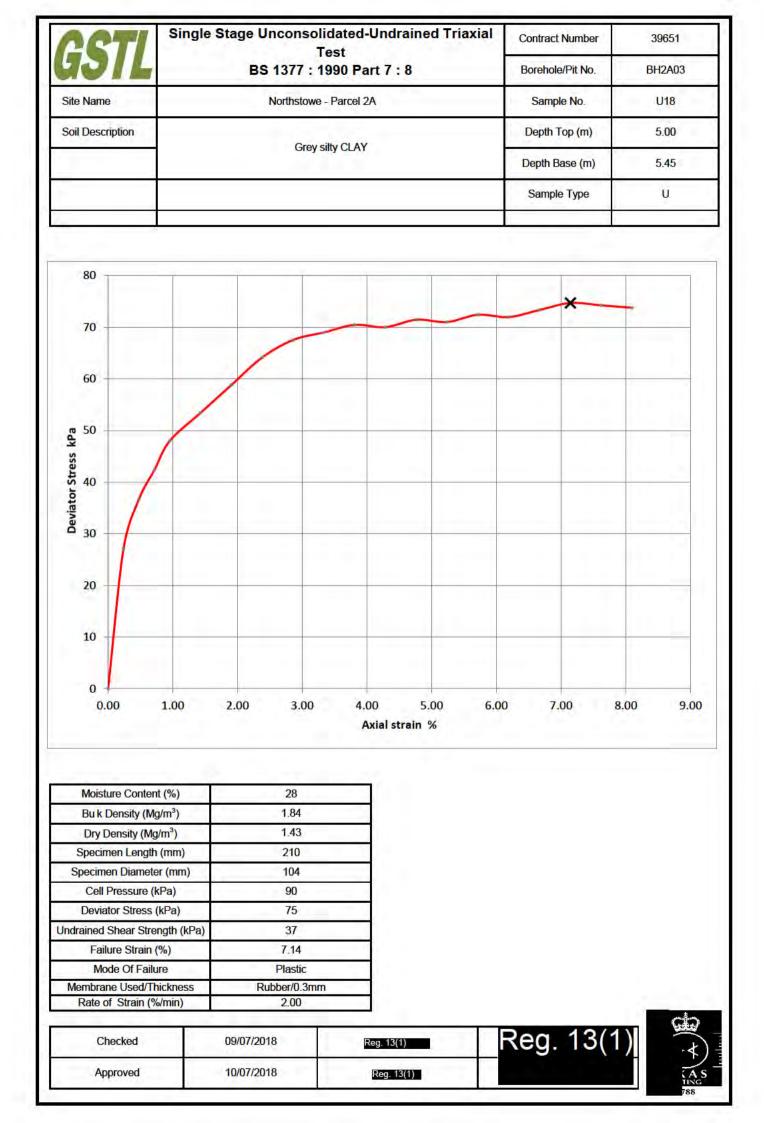
asi	Single	e Stage Unconsoli T	idated-Undrained est	l Triaxial	Contract Number	39651
101		BS 1377 : 1	990 Part 7 : 8		Borehole/Pit No.	BH2A02
Site Name	1.	Northstowe	- Parcel 2A		Sample No.	8
Soil Descriptio	on				Depth Top (m)	4.00
		Grey s	ilty CLAY		Depth Base (m)	4.45
				į	Sample Type	U
180	Ī		1	1		
160					×	
160						
140						
140		-				
120 —	/					
Deviator Stress kPa	C					
100 -				· · · · · · · · · · · · · · · · · · ·		
or St						
/ 08 /						
Dev						
60				-		
40						
20						
0				_		
0.00	1.00	2.00	3.00	4.00	5.00 6.00	7.0
			Axial strain 9			
Moieturo	Content (%)	364				
	sity (Mg/m <sup>3</sup> )	2.01				
	sity (Mg/m <sup>3</sup> )	0.43				
	Length (mm)	210				
Specimen [	Diameter (mm)	105				
Cell Pres	ssure (kPa)	50				
	Stress (kPa)	163				
	ear Strength (kPa)	81				
	Strain (%)	5.71				
	Of Failure Jsed/Thickness	Compound Rubber/0.3mm				
	train (%/min)	2.00				- 1
	ked	08/07/2018	Reg. 13(1)	IR	leg. 13(1)	
Check						P-41
Approv	heve	09/07/2018	Reg. 13(1)			-

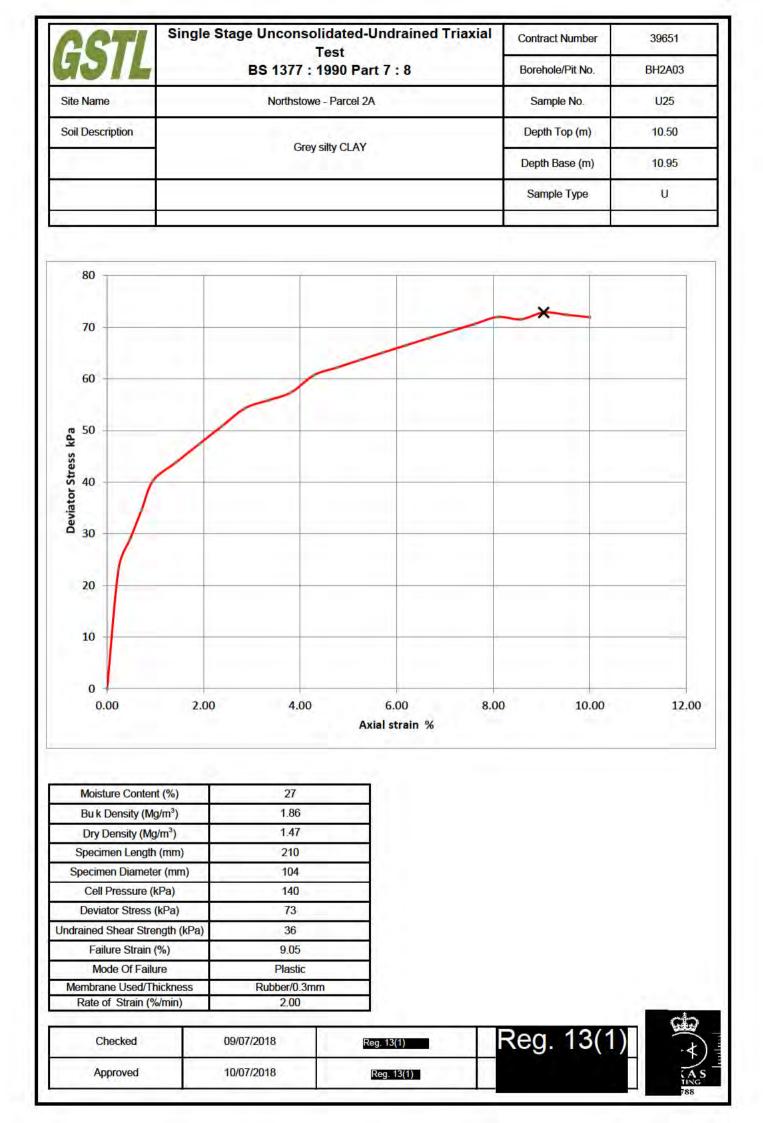




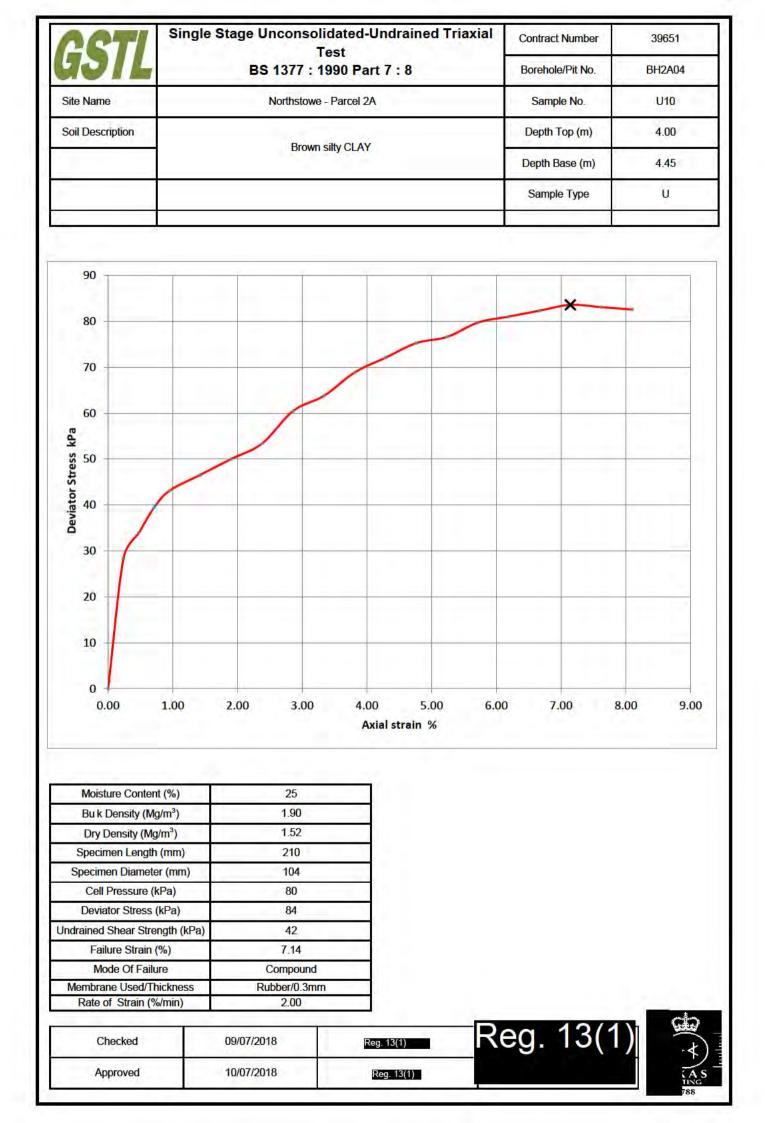
BS 1377 : 1990 Part 7 : 8         Borchole/Pit No.         Bit           Site Name         Northstowe - Parcel 2A         Sample No.         Image: Clay start of the start		Single Stage Und	consolidat Test	ed-Undraine	d Triaxial	Contract	Number	39651
Set Description         Grey sity CLAY         Depth Top (m)         1           0         0         3ample Type         1           0         3ample Type         1         1           00         0         0         0         1           00         0         0         0         1           00         0         0         0         1           00         0         0         0         0         0           00         0         0         0         0         0         0           00         0         0         0         0         0         0         0           00         0         0         0         0         0         0         0         0           00         0 <td< th=""><th>716</th><th>BS 1</th><th></th><th>Part 7 : 8</th><th></th><th>Borehole</th><th>e/Pit No.</th><th>BH2A02</th></td<>	716	BS 1		Part 7 : 8		Borehole	e/Pit No.	BH2A02
Grey sity CLAY         Dapth Base (m)         1           Sample Type         Sample Type         Sample Type           900	ime	No	orthstowe - Pare	cel 2A		Samp	le No.	20
Depth Base (m)         1           Sample Type	escription		Consumitty C			Depth	Гор (m)	12.00
900         000 <td></td> <td></td> <td>Grey sitty C</td> <td>LAY</td> <td></td> <td>Depth B</td> <td>ase (m)</td> <td>12.45</td>			Grey sitty C	LAY		Depth B	ase (m)	12.45
800       700       X         600       700       X         700       100       200         700       100       X         700       100       100         700       100       100         700       100       100         700       100       100         700 <td></td> <td></td> <td></td> <td></td> <td>ļ</td> <td>Sampl</td> <td>е Туре</td> <td>U</td>					ļ	Sampl	е Туре	U
800       700       X         600       700       X         700       200       300       4.00         500       7.00       X       X         700       2.00       3.00       4.00       5.00       6.00       7.00       8.00         Axial strain %       2.10       To       To       X <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
700     600       600     600       500     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       500     600       700     800       Axial strain %	0		1	-	1			
700     600       600     600       500     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       300     600       400     600       500     600       700     800       Axial strain %	0		-				×	
600         7.00         8.00         Axial strain %         62         800         Axial strain %         8.00         Axial strain %         8.00         Axial strain %         8.00         8.00         Axial strain %         8.00         8.00         8.00         8.00         8.00         8.00         Axial strain %         8.00							1000	
600         7.00         8.00         Axial strain %         62         800         Axial strain %         8.00         Axial strain %         8.00         Axial strain %         8.00         8.00         Axial strain %         8.00         8.00         8.00         8.00         8.00         Axial strain %         8.00								
Bulk Density (Mg/m <sup>3</sup> )         2.10           Dy Density (Mg/m <sup>3</sup> )         2.10           Specimen Length (mm)         210           Specimen Length (mm)         210           Specimen Strength (KPa)         115           Indrained Shear Strength (KPa)         815           Mode Of Failure         Compound           Rate of Strain (%/min)         2.00	00 +		-					
Bulk Density (Mg/m <sup>3</sup> )         2.10           Dy Density (Mg/m <sup>3</sup> )         2.10           Specimen Length (mm)         210           Specimen Length (mm)         210           Specimen Strength (KPa)         115           Indrained Shear Strength (KPa)         815           Mode Of Failure         Compound           Rate of Strain (%/min)         2.00								
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       2.00       8.00         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Moisture Content (%)       6.2       2.00	00		1		-			
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       2.00       8.00         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Moisture Content (%)       6.2       2.00							1	
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       2.00       8.00         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Moisture Content (%)       6.2       2.00			-					
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Specimen Length (mm)       2.10       2.00<		· · · / ·						
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Specimen Length (mm)       2.10       2.00<							1	
300       200       Axial strain %         Moisture Content (%)       6.2       200       200       2.00       2.00       2.00       8.00       Axial strain %         Moisture Content (%)       6.2       200       2.00       2.00       8.00       2.00       8.00         Moisture Content (%)       6.2       2.00       2.00       2.00       8.00       7.00       8.00         Moisture Content (%)       6.2       2.00	0	~			1			
200       1	1							
100       0								
100       0								
100       0								
Moisture Content (%)       6.2         Bu k Density (Mg/m <sup>3</sup> )       2.10         Dry Density (Mg/m <sup>3</sup> )       1.97         Specimen Length (mm)       210         Specimen Diameter (mm)       104         Cell Pressure (kPa)       120         Deviator Stress (kPa)       815         Indrained Shear Strength (kPa)       408         Failure Strain (%)       7.14         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00	10				1			
Moisture Content (%)       6.2         Bu k Density (Mg/m <sup>3</sup> )       2.10         Dry Density (Mg/m <sup>3</sup> )       1.97         Specimen Length (mm)       210         Specimen Diameter (mm)       104         Cell Pressure (kPa)       120         Deviator Stress (kPa)       815         Indrained Shear Strength (kPa)       408         Failure Strain (%)       7.14         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00		b						
0       0	00 +	_			-			
0.00         1.00         2.00         3.00         4.00         5.00         6.00         7.00         8.00           Axial strain %           Moisture Content (%)         6.2           Bu k Density (Mg/m <sup>3</sup> )         2.10           Dry Density (Mg/m <sup>3</sup> )         1.97           Specimen Length (mm)         210           Specimen Diameter (mm)         104           Cell Pressure (kPa)         120           Deviator Stress (kPa)         815           Indrained Shear Strength (kPa)         408           Failure Strain (%)         7.14           Mode Of Failure         Compound           Membrane Used/Thickness         Rubber/0.3mm           Rate of Strain (%/min)         2.00								
0.00         1.00         2.00         3.00         4.00         5.00         6.00         7.00         8.00           Axial strain %           Moisture Content (%)         6.2           Bu k Density (Mg/m <sup>3</sup> )         2.10           Dry Density (Mg/m <sup>3</sup> )         1.97           Specimen Length (mm)         210           Specimen Diameter (mm)         104           Cell Pressure (kPa)         120           Deviator Stress (kPa)         815           Indrained Shear Strength (kPa)         408           Failure Strain (%)         7.14           Mode Of Failure         Compound           Membrane Used/Thickness         Rubber/0.3mm           Rate of Strain (%/min)         2.00								
Axial strain %Moisture Content (%)6.2Bu k Density (Mg/m³)2.10Dry Density (Mg/m³)1.97Specimen Length (mm)210Specimen Diameter (mm)104Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00		2.00	2.00	100			00	8.00 9.0
Bu k Density (Mg/m³)2.10Dry Density (Mg/m³)1.97Specimen Length (mm)210Specimen Diameter (mm)104Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00			5.00					0.00 5.0
Dry Density (Mg/m³)1.97Specimen Length (mm)210Specimen Diameter (mm)104Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	oisture Content (%	)	6.2					
Specimen Length (mm)210Specimen Diameter (mm)104Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	stare controlit (70	No.	2.10					
Specimen Diameter (mm)104Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	COLUMN COMPANY COLUMN		1.97					
Cell Pressure (kPa)120Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	uk Density (Mg/m <sup>3</sup>	n)	210					
Deviator Stress (kPa)815Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> )	<b>9</b>						
Indrained Shear Strength (kPa)408Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn		104	- 74				
Failure Strain (%)7.14Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	uk Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn cimen Diameter (m	m)	2.7.2					
Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mr cimen Diameter (m cell Pressure (kPa)	m)	120	-				
Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa	m)	120 815	=				
Membrane Used/Thickness     Rubber/0.3mm       Rate of Strain (%/min)     2.00	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mr cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa ed Shear Strength	m) ) (kPa)	120 815 408					
	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa ed Shear Strength Failure Strain (%)	m) ) (kPa)	120 815 408 7.14					
	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa ed Shear Strength Failure Strain (%) Mode Of Failure	m) (kPa) Cor	120 815 408 7.14 mpound					
Checked 08/07/2018 Reg. 13(1) Reg. 13(1)	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mr cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa ed Shear Strength Failure Strain (%) Mode Of Failure brane Used/Thickn	m) (kPa) Cor ess Rubb	120 815 408 7.14 mpound per/0.3mm					
Approved 09/07/2018 Reg. 13(1)	u k Density (Mg/m <sup>3</sup> ry Density (Mg/m <sup>3</sup> ) ecimen Length (mn cimen Diameter (m cell Pressure (kPa) eviator Stress (kPa ed Shear Strength Failure Strain (%) Mode Of Failure brane Used/Thickn te of Strain (%/min	m) (kPa) Cor ess Rubb n)	120 815 408 7.14 mpound per/0.3mm	Reg. 13(1)		Reg.	13(1	

45	71	Single	Stage U		lidate Test	d-Undr	ained T	riaxial	Contra	ct Number		39651
20			BS	1377 :		Part 7 :	8		Boreh	ole/Pit No.	E	3H2A03
Site Name				Northstowe	e - Parce	1 2A			San	nple No.		15
Soil Descri	iption								Dept	n Top (m)	-	3.00
				Grey	silty CLA	AY.			Depth	Base (m)		3.45
									Sam	ple Type		U
100	1	1	1	1				Ĩ			×	
90		ļ	_						-		^	-
			1111			1						11
80			_	_	/			-		_		
	1			/								
70	+				_			+		_	-	
			/									
Deviator Stress kPa 00 00 00			1		-		-	-		_		
ress		1										
50 S	-	1			-		-	-	-	-		
iato												
ad 40	- /		-						-	_		
30	1		-									
6.62				_								
20	1	1					6	1		T.		
10												
0												
	.00 1	.00	2.00	3.00	4.00	5.	00	6.00	7.00	8.00	9.00	10.0
							train %					
					_							
					_	-						
	ure Content (			32 1.81	-	-						
	Density (Mg/r Density (Mg/n		_	1.81		-						
	nen Length (r			210	-	-						
Specim				104								
	en Diameter	(11111)	1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-							
Specime	en Diameter Pressure (kP			60								
Specime Cell F	en Diameter Pressure (kP tor Stress (kl	a)		60 95								
Specime Cell F Deviat	Pressure (kP	a) Pa)										
Specime Cell F Deviat Indrained S	Pressure (kP tor Stress (kl	a) Pa) jth (kPa)		95								
Specime Cell F Deviat Indrained S Failu Mod	Pressure (kP tor Stress (kl Shear Streng ure Strain (% de Of Failure	a) Pa) jth (kPa) )		95 47 8.57 Plastic								
Specime Cell F Deviat Indrained S Failu Moo Membran	Pressure (kP tor Stress (kl Shear Streng ure Strain (% de Of Failure ne Used/Thic	a) Pa) th (kPa) ) ) kness	Ru	95 47 8.57 Plastic ibber/0.3m	m							
Specime Cell F Deviat Indrained S Failu Moo Membran	Pressure (kP tor Stress (kl Shear Streng ure Strain (% de Of Failure	a) Pa) th (kPa) ) ) kness	Ru	95 47 8.57 Plastic	m							بسؤسر
Specime Cell F Deviat Indrained S Failu Moo Membran Rate of	Pressure (kP tor Stress (kl Shear Streng ure Strain (% de Of Failure ne Used/Thic	a) Pa) th (kPa) ) ) kness	Ru 08/07/201	95 47 8.57 Plastic bber/0.3mr 2.00	m	Reg. 13(1	1).	R	leg.	13(	<b>1)</b> ]	×.)€





P	STL	Single	Stage Unconsol T	idated-Undra 'est	ined Triaxial	Contract Number	39651
2	OIL			990 Part 7 : 8	3	Borehole/Pit No.	BH2A04
Site	Name	4	Northstowe	- Parcel 2A		Sample No.	6
Soil	Description	1	Brown alig	htly silty CLAY		Depth Top (m)	2.00
			Brown sligi	nuy siny CLAY		Depth Base (m)	2.45
						Sample Type	U
	100			10	1		Ì
	90					×	
	80						
	70			-			
	70						
Pa	60						
Deviator Stress kPa	00						
Stre	50	1					
tor		/					
evia	40						
0	/						
	30						
		-					
	20						
	10						
	0			125	25415		
	0.00	1.00	2.00	3.00 Axial str	4.00 ain %	5.00 6.00	7.0
Ŋ	Moisture Conter	nt (%)	29				
	Buk Density (M		1.91				
	Dry Density (M		1.48				
_	Specimen Lengtl pecimen Diamet		210 104				
Sp	Cell Pressure (	10200	40				
	Deviator Stress		87				
	ained Shear Stre	1.11 1.12	44				
_			5.24				
_	Failure Strain		Compound				
Indra	Failure Strain Mode Of Fail						
Jndra Me	Failure Strain Mode Of Fail embrane Used/T	hickness	Rubber/0.3mm	1			
Indra	Failure Strain Mode Of Fail	hickness		1			~
Jndra Me	Failure Strain Mode Of Fail embrane Used/T	hickness	Rubber/0.3mm	n Reg. 13(1)		Reg. 13(1	



GSTI	Single Stage Unconsolidated-Undrained Triaxial Test	Contract Number	39651
<b>AVIL</b>	BS 1377 : 1990 Part 7 : 8	Borehole/Pit No.	BH2A04
Site Name	Northstowe - Parcel 2A	Sample No.	14
Soil Description	Crow sitte CLAV	Depth Top (m)	6.00
	Grey silty CLAY	Depth Base (m)	6.45
		Sample Type	U
1200 1000 800 800 400			
400			

0	-	-		-	_
0					

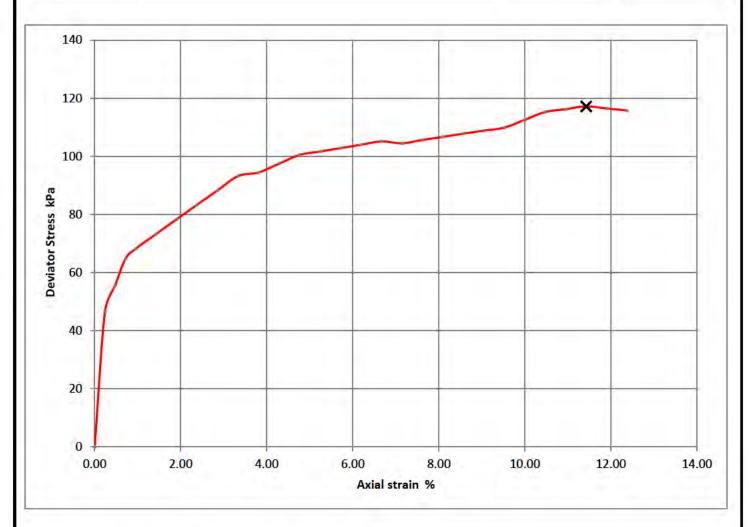
Moisture Content (%)	28	-			
Bu k Density (Mg/m <sup>3</sup> )	2.19				
Dry Density (Mg/m <sup>3</sup> )	1.72				
Specimen Length (mm)	200				
Specimen Diameter (mm)	101				
Cell Pressure (kPa)	110				
Deviator Stress (kPa)	1097				
Undrained Shear Strength (kPa)	548				
Failure Strain (%)	9.00	-			
Mode Of Failure	Compound				
Membrane Used/Thickness	Rubber/0.3mm	1			
Rate of Strain (%/min)	2.00				
Checked	08/07/2018				

Checked	08/07/2018	Reg. 13(1)	Reg. 13(1)	
Approved	09/07/2018	Reg. 13(1)		5
Sales (Sales and				

H	STL	Single		T	est	ndrained	Triaxial	1	ct Number ble/Pit No.	39651 BH2A04
			20150		990 Part	7:8		1 Address of		
Site Na		1		Northstowe	- Parcel 2A				ple No.	19
Soil De	escription			Grey sligh	tly silty CLA	1		Depth	Top (m)	9.00
		5		1.11				Depth	Base (m)	9.45
_		_						Sam	ple Type	U
1(	00									
1										
9	90	-							~	×
						-				
5	80			1						
	70			/						
			/							
Deviator Stress kPa	60				_					
ress		1								
r Stu	50					-				
viato										
Dev	40									
-	30									
	20									
1	10									
	0 🖡		1.515			- 6.45				
-	0.00	1.00	2.00	. 3	3.00 Axi	4.00 al strain  %	5.00	6.0	0 7.	00 8.00
M	oisture Conte	nt (%)		28						
	u k Density (M			1.91	-					
_	ory Density (M ecimen Lengt			1.49 210						
	cimen Diame			105						
	Cell Pressure			170						
De	eviator Stress	(kPa)		89						
_	ned Shear Str			44	T					
	Failure Strain			7,14						
	Mode Of Fail brane Used/T	* * * * * * * *		Compound Ibber/0.3mm	-					
	te of Strain (		Ru	2.00						1
	Checked		08/07/201	8	Reg	. 13(1)	F	Reg.	13(1	
-	Approved	1.1.1	09/07/201	8		eg. 13(1)	a			(A TINC

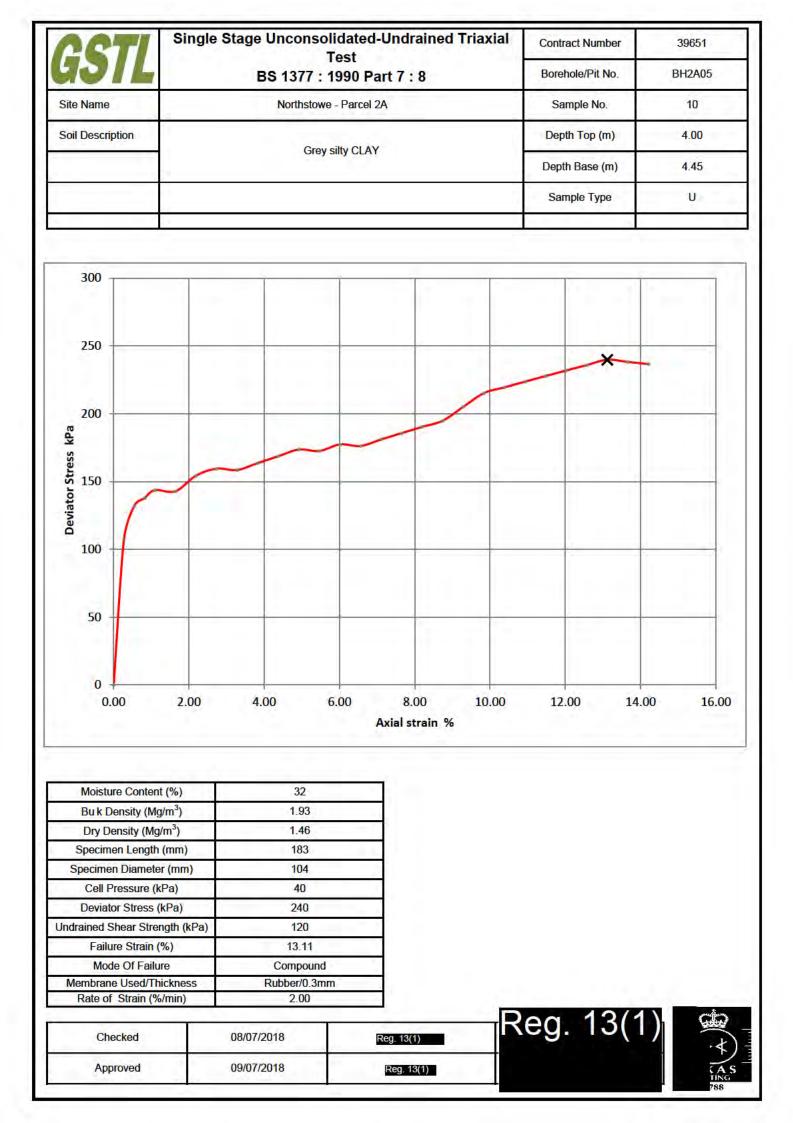
	Single	Stage Unc	onsolida: Tes		ained Triaxial	Contra	ct Number	39651 BH2A04 23	
GSTL		BS 13		0 Part 7 :	8	Boreho	ole/Pit No.		
Site Name		Nor	rthstowe - Pa	arcel 2A		Sam	ple No.		
Soil Description					Depth	Top (m)	12.00		
		Grey silty CLAY			Depth	Base (m)	12.45		
						Sam	ole Type	U	
	_				_				
300							×		
250	_								
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			1						
200								-	
Deviator Stress kPa		/							
ess		1							
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ator	/								
Jevi									
100	a.,						-		
100									
50					. 1				
						1.1.1.1		1	
0			-				1.5.7		
	1.00	2.00	3.00	4.00		00	7.00	8.00 9.0	
0.00				Axial s	train %				
0.00									
0.00									
0.00									
0.00 Moisture Content	(%)		27	_					
Moisture Content Bu k Density (Mg	/m³)	2	2.05						
Moisture Content Bu k Density (Mg Dry Density (Mg/	/m <sup>3</sup> ) /m <sup>3</sup> )	2	2.05 1.61						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm)	2 1 3	2.05 1.61 210						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm)	1	2.05 1.61 210 104						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa)	2	2.05 1.61 210 104 230						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (k	/m <sup>3</sup> ) //m <sup>3</sup> /m <sup>3</sup>		2.05 1.61 210 104 230 281						
Moisture Content Bu k Density (Mg/ Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (k Indrained Shear Stree	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) kPa) kPa) ngth (kPa)		2.05 1.61 210 104 230 281 140						
Moisture Content Bu k Density (Mg/ Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain (	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) Pa) kPa) skPa) ngth (kPa) %)		2.05 1.61 210 104 230 281 140 7.14						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (ki Deviator Stress (l Indrained Shear Strem Failure Strain ( Mode Of Failur	/m <sup>3</sup> ) //m <sup>3</sup>	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2.05 1.61 210 104 230 281 140 7.14 npound						
Moisture Content Bu k Density (Mg/ Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain (	/m <sup>3</sup> ) (mm) (mm) r (mm) Pa) Pa) kPa) stPa) stPa) (kPa) stPa) (kPa) stPa) re	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2.05 1.61 210 104 230 281 140 7.14						
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	/m <sup>3</sup> ) (mm) (mm) r (mm) Pa) Pa) kPa) stPa) stPa) (kPa) stPa) (kPa) stPa) re	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2.05 1.61 210 104 230 281 140 7.14 npound er/0.3mm		F	lea	13(	(1)	
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	/m <sup>3</sup> ) (mm) (mm) r (mm) Pa) Pa) kPa) stPa) stPa) (kPa) stPa) (kPa) stPa) re	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2.05 1.61 210 104 230 281 140 7.14 npound er/0.3mm			leg.	13(	(1)	

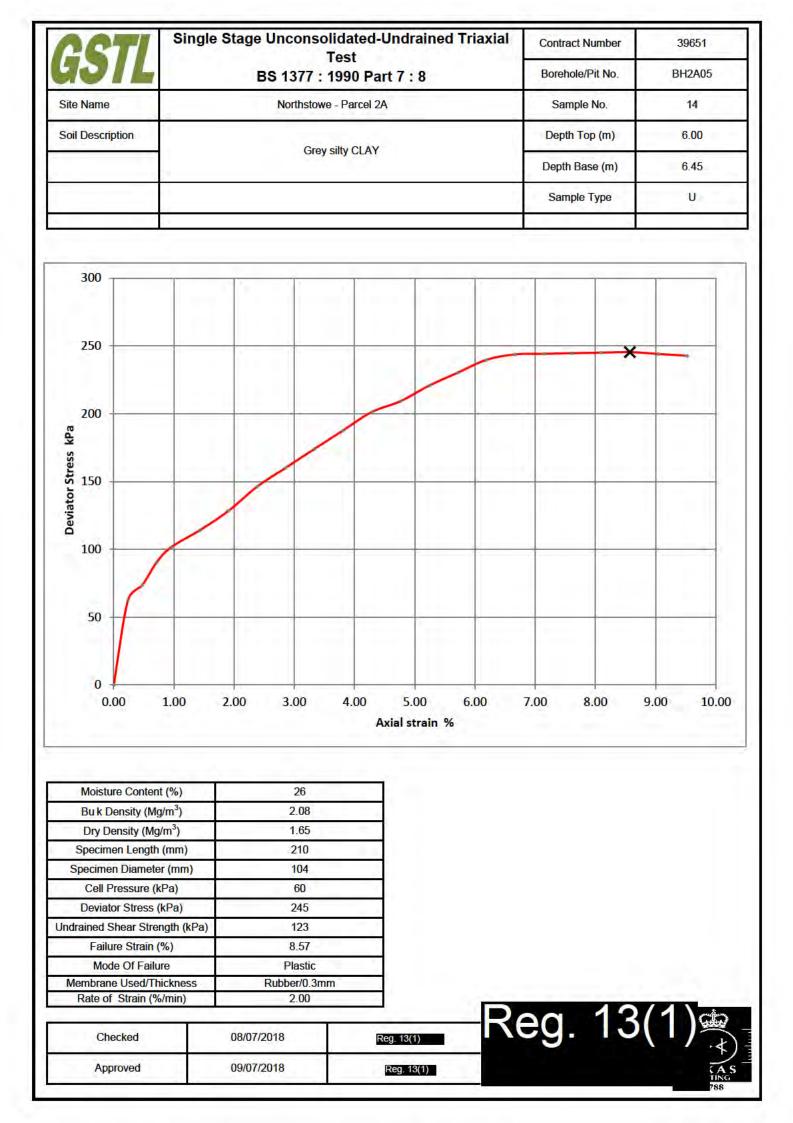
CCTI	Single Stage Unconsolidated-Undrained Triaxial Test	Contract Number	39651
<b>HOIL</b>	BS 1377 : 1990 Part 7 : 8	Borehole/Pit No.	BH2A05
Site Name	Northstowe - Parcel 2A	Sample No.	6
Soil Description	Description and stability and to OLAV	Depth Top (m)	2.00
	Brownish grey slightly sandy CLAY	Depth Base (m)	2.45
		Sample Type	U



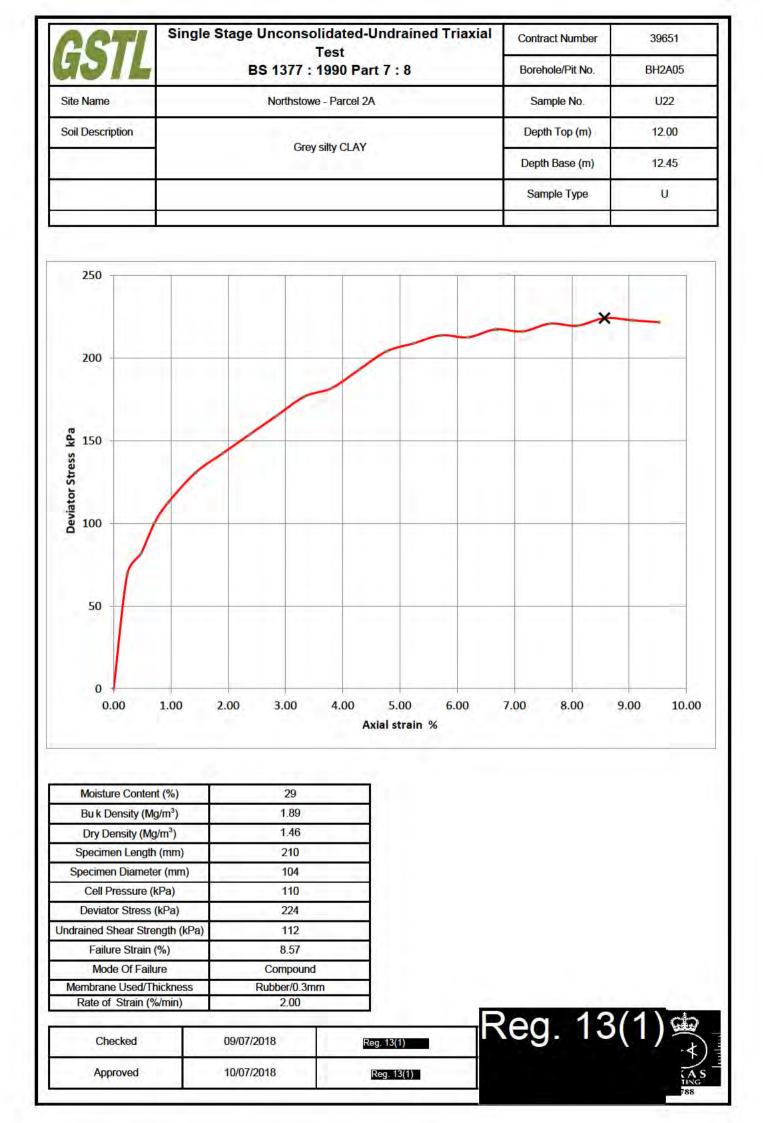
Moisture Content (%)	31
Buk Density (Mg/m <sup>3</sup> )	1.93
Dry Density (Mg/m <sup>3</sup> )	1.47
Specimen Length (mm)	210
Specimen Diameter (mm)	105
Cell Pressure (kPa)	30
Deviator Stress (kPa)	117
Undrained Shear Strength (kPa)	59
Failure Strain (%)	11.43
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	2.00

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Approved 09/07/2018	8	Reg. 13(1)		(A) 15 785

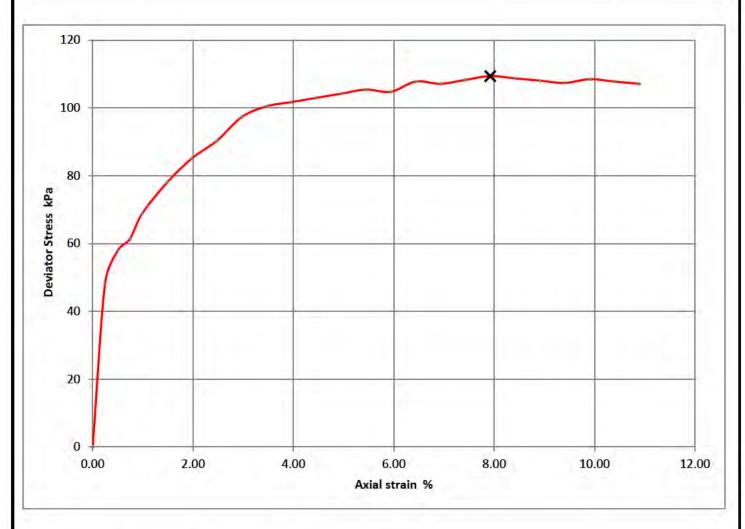




	Single	Stage Unconsoli T	dated-Un est	drained Tri	iaxial	Contract N	Number	39651	
GSTL		BS 1377 : 1		: 8		Borehole/Pit No.		BH2A05	
Site Name		Northstowe	- Parcel 2A			Sample	No.	18	
Soil Description						Depth Top (m)		9.00	
		Grey silty CLAY				Depth Base (m)		9.45	
					j	Sample	Туре	U	
					N.				
250		1 1			1		-	Ť.	
200						-	×		
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Deviator Stress kPa 100									
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ator									
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0.00			Axia						
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0.00				i strain %	_				
Moisture Content	: (%)	27		i strain %					
		27 1.89		i strain %					
Moisture Content	/m <sup>3</sup> )			i strain %					
Moisture Content Bu k Density (Mg	/m <sup>3</sup> ) /m <sup>3</sup> )	1.89		i strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm)	1.89 1.48		i strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm)	1.89 1.48 210		i strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (k	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) kPa)	1.89 1.48 210 104 90 209		i strain %					
Moisture Content Bu k Density (Mg/ Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (k Indrained Shear Stree	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) kPa) kPa) ngth (kPa)	1.89 1.48 210 104 90 209 105		i strain %					
Moisture Content Bu k Density (Mg/ Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain (	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) r (mm) Pa) Pa) kPa) kPa) ngth (kPa) %)	1.89 1.48 210 104 90 209 105 7.62		i strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (ki Deviator Stress (l Indrained Shear Strem Failure Strain ( Mode Of Failur	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) Pa) kPa) kPa) ngth (kPa) %) re	1.89 1.48 210 104 90 209 105 7.62 Compound		i strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) Pa) kPa) kPa) mgth (kPa) %) re re	1.89 1.48 210 104 90 209 105 7.62 Compound Rubber/0.3mm		strain %					
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (ki Deviator Stress (l Indrained Shear Strem Failure Strain ( Mode Of Failur	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) Pa) kPa) kPa) mgth (kPa) %) re re	1.89 1.48 210 104 90 209 105 7.62 Compound		strain %			4.0		
Moisture Content Bu k Density (Mg Dry Density (Mg/ Specimen Length Specimen Diameter Cell Pressure (k Deviator Stress (l Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	/m <sup>3</sup> ) /m <sup>3</sup> ) (mm) r (mm) Pa) Pa) kPa) kPa) mgth (kPa) %) re re	1.89 1.48 210 104 90 209 105 7.62 Compound Rubber/0.3mm			R	eg.	13	(1) 🗭	



CCTI	Single Stage Unconsolidated-Undrained Triaxial Test	Contract Number	39651
adil	BS 1377 : 1990 Part 7 : 8	Borehole/Pit No.	BH2A06
Site Name	Northstowe - Parcel 2A	Sample No.	14
Soil Description		Depth Top (m)	2.00
	Grey slightly sandy silty CLAY	Depth Base (m)	2.45
		Sample Type	U



Reg. 13(1)

Checked	08/07/2018	Reg. 13(1)
Rate of Strain (%/min)	2.00	
Membrane Used/Thickness	Rubber/0.3mm	
Mode Of Failure	Compound	
Failure Strain (%)	7.92	
Undrained Shear Strength (kPa)	55	- 1
Deviator Stress (kPa)	109	
Cell Pressure (kPa)	40	1
Specimen Diameter (mm)	103	
Specimen Length (mm)	202	10.00
Dry Density (Mg/m <sup>3</sup> )	1.44	
Bu k Density (Mg/m <sup>3</sup> )	1.89	
Moisture Content (%)	31	

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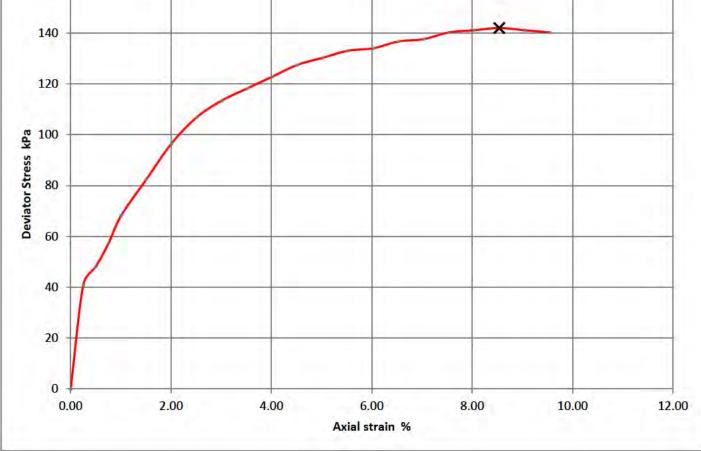
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Reg. 13(1)



Site Name Soil Description	North	Test 77 : 1990 Instowe - Par Grey silty C	Part 7	: 8		Samı Depth Depth I	le/Pit No. ple No. Top (m) Base (m) ole Type		3H2A06 25 6.00 6.45 U
Soil Description	Acces					Depth Depth I	Top (m) Base (m) Ne Type		6.00 6.45
140 120 100 80 80		Grey silty C				Depth I	Base (m)		6.45
140 120 100 80 80							ole Type		
140 120 100 80 80						Samp			U
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<b>й</b> 60									- 11
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0.00 1.00	2.00 3.00	0 4.0		5.00 6. strain %	00	7.00	8.00	9.00	10.0
Moisture Content (%)	29								
Bu k Density (Mg/m <sup>3</sup> )	1.8		-						
Dry Density (Mg/m <sup>3</sup> )	1.4								
Specimen Length (mm)									
Specimen Diameter (mm									
Cell Pressure (kPa)	10		1						
Deviator Stress (kPa)	13	1.1	- 4						
Indrained Shear Strength (k									
Failure Strain (%)	8.8								
Mode Of Failure	Comp		- 51						
Membrane Used/Thicknes Rate of Strain (%/min)	ss Rubber/ 2.0		1			1	4.0		-
Checked	08/07/2018		Reg. 13	(1)	$\neg R$	leg.	13(	1)	€
Approved	09/07/2018	1.1	Reg. 1	13(1)					+)A

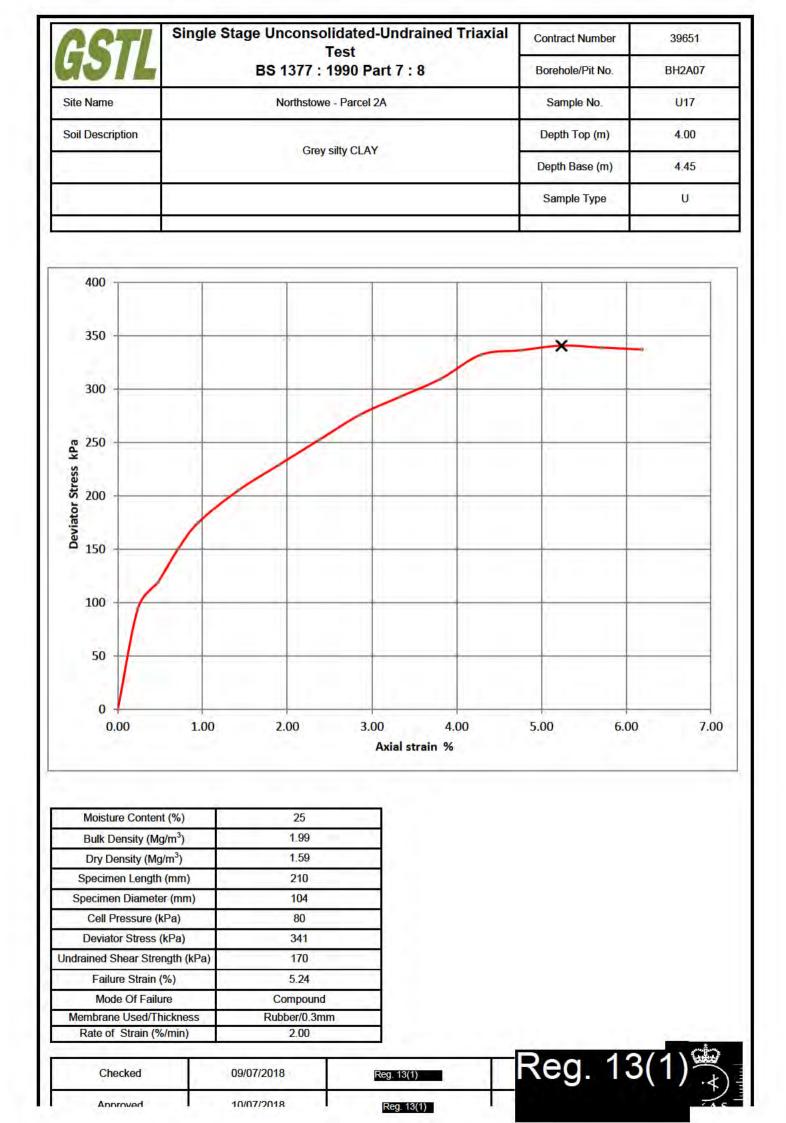
CGTI	Single Stage Unconsolidated-Undrained Triaxial Test	Contract Number	39651
ADIL	BS 1377 : 1990 Part 7 : 8		BH2A06
Site Name	Northstowe - Parcel 2A	Sample No.	31
Soil Description	Brown silty CLAY	Depth Top (m)	9.00
		Depth Base (m)	9.45
		Sample Type	U
160			
140		×	



Moisture Content (%)	28
Buk Density (Mg/m <sup>3</sup> )	1.88
Dry Density (Mg/m <sup>3</sup> )	1.47
Specimen Length (mm)	199
Specimen Diameter (mm)	105
Cell Pressure (kPa)	120
Deviator Stress (kPa)	142
Undrained Shear Strength (kPa)	71
Failure Strain (%)	8.54
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	2.00

Checked	08/07/2018	Reg. 13(1)	Reg. 13(1)	
Approved	09/07/2018	Reg. 13(1)		C

GSTL	Single	Stage Unconso	lidated-Ur Test	ndrained T	riaxial	Contract I	Number	39651	
JICK		BS 1377 :	1990 Part	7:8	-	Borehole/Pit No.		BH2A07	
Site Name		Northstow	e - Parcel 2A	, Ithur the		Sample No.		12	
Soil Description						Depth Top (m)		2.00	
		Brown sandy silty CLAY			Depth Base (m)		2.45		
					- j	Sample	Туре	U	
180	T	1. 1	1	1	i i	1	1		
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160	-		-	-			×		
					1				
140	-	-		-		-			
120	-			-	-		-		
Deviator Stress kPa									
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08 jato	1		_	-					
Dev	/								
60	4				+	-	-		
40			_					_	
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0									
	1.00	2.00 3.00	4.00	5.00	6.00	7.00	8.00	9.00 10.00	
0.00	1.00	2.00 5.00		al strain %	0.00	7.00	5.00	5.00 10.00	
	(0/)								
Moisture Content		26 1.91	-						
Bu k Density (Mg Dry Density (Mg/		1.91							
Specimen Length		202							
Specimen Diameter		104	_						
		40							
Cell Pressure (kl		157							
		70							
Cell Pressure (kl Deviator Stress (k		79							
Cell Pressure (kl	ngth (kPa)	79 8.42							
Cell Pressure (kl Deviator Stress (k Indrained Shear Stren Failure Strain ( Mode Of Failur	ngth (kPa) %) re	8.42 Plastic							
Cell Pressure (kl Deviator Stress (k Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	ngth (kPa) %) re ickness	8.42 Plastic Rubber/0.3m	m						
Cell Pressure (kl Deviator Stress (k Indrained Shear Stren Failure Strain ( Mode Of Failur	ngth (kPa) %) re ickness	8.42 Plastic	m			Rea	. 13	B(1)	
Cell Pressure (kl Deviator Stress (k Indrained Shear Stren Failure Strain ( Mode Of Failur Membrane Used/Thi	ngth (kPa) %) re ickness	8.42 Plastic Rubber/0.3m		. 13(1)		Reg	. 13	3(1) (*)	



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CCTI	Single	e Stage Unconsoli	dated-Undr est	ained Triaxial	Contract Nur	nber	39651	
GSTL		BS 1377 : 1		8	Borehole/Pit	No.	BH2A07	
Site Name		Northstowe	- Parcel 2A		Sample N	0.	21	
Soil Description	1				Depth Top	(m)	6.00	
		Grey s	ilty CLAY		Depth Base	(m)	6.45	
					Sample Ty	ре	U	
				-	-			
300								
						×		
250	-						_	
			-					
200		_		_				
a management of the second sec								
Deviator Stress kPa	/							
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ator								
Devi								
100	-							
50	_							
				- 1				
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0.00	1.00	2.00 3.00	4.00 Axial st	5.00 6.0 train %	00 7.00	8.00	9.0	
	1.00							
Moisture Conte Bu k Density (N		33 1.96						
Dry Density (M		1.90						
Specimen Lengt		210						
Specimen Diamet		104						
Cell Pressure		1 <mark>1</mark> 0						
Deviator Stress	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	268						
Indrained Shear Stroin		134						
Failure Strain Mode Of Fail		7.62 Compound						
and a second second second second		Rubber/0.3mm						
Membrane Used/T		2.00						
Membrane Used/T Rate of Strain (					_		CLO CLO	
		08/07/2018	Reg. 13(1	t)	Reg. 1	3(1)	, )( , , , , , , , , , , , , , , , , , , ,	

BS 1377 : 1990 Part 7 : 8     Borehole/Pit No.       Site Name     Northstowe - Parcel 2A     Sample No.       Sold Description     Grey sity CLAY     Depth Top (m)       Depth Top (m)     Depth Top (m)       Depth Top (m)     Depth Top (m)       Depth Top (m)     Sample Type	39651	Contract Number	Irained Triaxial	Stage Unconsolidated- Test	Single
Soil Description         Grey sity CLAY         Depth Top (m)           Depth Base (m)         Sample Type           200         Sample Type           200         Image: Content of the second	BH2A07	Borehole/Pit No.	: 8		JJIL
Groy sity CLAY         Dopth Base (m)           Sample Type            200         3           200         4           200         4           200         4           200         4           200         4           200         4           200         4           201         50           202         4           203         4           204         5           205         200           200         4           201         5           202         2           203         2           204         5           205         200           200         4           200         4           200         5           200         2           200         2           200         2           201         2           202         2           203         2           204         100           205         100           206         100           207         208	25	Sample No.		Northstowe - Parcel 2	Site Name
Depth Base (n)         Sample Type           250	8.00	Depth Top (m)		Soil Description	
250     0<	8.45	Depth Base (m)		Grey silty CLAY	
200     400 <th>U</th> <th>Sample Type</th> <th></th> <th></th> <th></th>	U	Sample Type			
200       4					
eg       150       150         100       100       100         50       0       0.00         2.00       4.00       6.00         8.00       10.00         Axial strain %					250
eg       150       150         100       100       100         50       0       0.00         2.00       4.00       6.00         8.00       10.00         Axial strain %					
eg       150       150         100       100       100         50       0       0.00         2.00       4.00       6.00         8.00       10.00         Axial strain %	-		X		200
50       50 <td< td=""><td></td><td></td><td></td><td></td><td>200</td></td<>					200
50       50 <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
50       50 <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
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50       50 <td< td=""><td></td><td></td><td></td><td></td><td>ess</td></td<>					ess
50       50 <td< td=""><td></td><td></td><td></td><td></td><td>Str</td></td<>					Str
50       50 <td< td=""><td></td><td></td><td></td><td></td><td>ator</td></td<>					ator
50       50 <td< td=""><td></td><td></td><td></td><td></td><td>100</td></td<>					100
Moisture Content (%)       29         Bu k Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       1.62         Specimen Length (mm)       202         Specimen Diameter (mm)       101         Cell Pressure (kPa)       150         Deviator Stress (kPa)       216         Indrained Shear Strength (kPa)       108         Failure Strain (%)       7.92         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00					
Moisture Content (%)       29         Bu k Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       1.62         Specimen Length (mm)       202         Specimen Diameter (mm)       101         Cell Pressure (kPa)       150         Deviator Stress (kPa)       216         Indrained Shear Strength (kPa)       108         Failure Strain (%)       7.92         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00					
Moisture Content (%)       29         Bu k Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       1.62         Specimen Length (mm)       202         Specimen Diameter (mm)       101         Cell Pressure (kPa)       150         Deviator Stress (kPa)       216         Indrained Shear Strength (kPa)       108         Failure Strain (%)       7.92         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00				0.00	/
Moisture Content (%)       29         Bu k Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       2.08         Dry Density (Mg/m <sup>3</sup> )       1.62         Specimen Length (mm)       202         Specimen Diameter (mm)       101         Cell Pressure (kPa)       150         Deviator Stress (kPa)       216         Indrained Shear Strength (kPa)       108         Failure Strain (%)       7.92         Mode Of Failure       Compound         Membrane Used/Thickness       Rubber/0.3mm         Rate of Strain (%/min)       2.00			-		50
0.002.004.006.008.0010.00Axial strain %Moisture Content (%)29Bu k Density (Mg/m³)2.08Dry Density (Mg/m³)1.62Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Indrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00					
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Axial strain %Moisture Content (%)29Bu k Density (Mg/m³)2.08Dry Density (Mg/m³)1.62Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Jndrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00					
Moisture Content (%)29Bu k Density (Mg/m³)2.08Dry Density (Mg/m³)1.62Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Jndrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00	12.0	10.00			0.00 2.
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Bu k Density (Mg/m³)2.08Dry Density (Mg/m³)1.62Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Jndrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00					
Dry Density (Mg/m³)1.62Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Indrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00				29	Moisture Content (%)
Specimen Length (mm)202Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Indrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00					
Specimen Diameter (mm)101Cell Pressure (kPa)150Deviator Stress (kPa)216Indrained Shear Strength (kPa)108Failure Strain (%)7.92Mode Of FailureCompoundMembrane Used/ThicknessRubber/0.3mmRate of Strain (%/min)2.00					
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Rate of Strain (%/min) 2.00					
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Approved 09/07/2018 Reg. 13(1)	(1)	Reg. 13(1)	6(1)	08/07/2018	Checked

# APPENDIX G

GEO-ENVIRONMENTAL LABORATORY TEST DATA



Reg. 13(1) Arcadis Consulting (UK) Ltd 10 Medawar Road The Surrey Research Park Guildford Surrey GU2 7AR

t: 0870 000 3005 f: 0870 000 3905 e: Reg. 13(1) arcadis.com



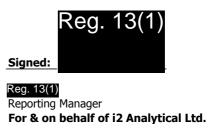
i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

t: 01923 225404 f: 01923 237404 e: reception@i2analytical.com

## Analytical Report Number : 18-88220

Replaces Analytical Report Number : 18-88220, issue no. 2

Project / Site name:	Northstowe - Parcel 2A	Samples received on:	04/06/2018
Your job number:	10018973	Samples instructed on:	07/06/2018
Your order number:		Analysis completed by:	13/07/2018
Report Issue Number:	3	Report issued on:	27/07/2018
Samples Analysed:	24 soil samples		



Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	<ul> <li>4 weeks from reporting</li> </ul>
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.





### Analytical Report Number: 18-88220

Project / Site name: Northstowe - Parcel 2A

Lab Sample Number				976854	976855	976856	976857	976858
Sample Reference	BH2A03	BH2A03	BH2A06	BH2A06	BH2A07			
Sample Number				1	10	1	7	4
Depth (m)				0.00-0.20	1.50-2.00	0.00-0 20	0.80-1.20	0.20-0.50
Date Sampled				31/05/2018	31/05/2018	31/05/2018	30/05/2018	29/05/2018
Time Taken		1		None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.8	21	8.7	8.1	19
Total mass of sample received	kg	0.001	NONE	1.1	0.77	1.2	1.2	1.2
• • •								
Asbestos in Soil Screen / Identification Name	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics	-	1						
pH - Automated	pH Units	N/A	MCERTS	7.8	7.8	7.8	7.9	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.065	0.011	0 014	0.094
Total Organic Carbon (TOC)	%	0.00123	MCERTS	1.6	0.003	0.011	0.014	0.5
Total organic carbon (Toc)	70	0.1	HELKIJ	1.0				0.5
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 10	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.24	< 0.05	< 0.05
Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.50	< 0.05	< 0.05
Pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.42	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.19	< 0.05	< 0.05
Chrysene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.27	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.25	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	0.12	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0 05	MCERTS	< 0.05 < 0.05	< 0.05 < 0.05	0.19 < 0.05	< 0.05 < 0.05	< 0.05 < 0.05
Indeno(1 2 3-cd)pyrene Dibenz(a h)anthracene	mg/kg	0.05	MCERTS MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Denzo(giii/peryiene	шу/ку	0.02	PICERIS	< 0.05	< 0.05	< 0.05	< 0.0J	< 0.0J
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	2.18	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	13	14	14	24
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	2.0	0.8	1.0	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0 2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4 0	< 4.0	< 4.0	< 4.0
	mg/kg	1	MCERTS	22	36	25	25	63
Chromium (aqua regia extractable)		4	MCERTS	13	15	14	9.4	16
Chromium (aqua regia extractable) Copper (aqua regia extractable)	mg/kg	1	FICERTS					
	mg/kg mg/kg	1	MCERTS	17	15	22	12	20
Copper (aqua regia extractable)						22 < 0.3		20 < 0.3
Copper (aqua regia extractable) Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	15		12	
Copper (aqua regia extractable) Lead (aqua regia extractable) Mercury (aqua regia extractable)	mg/kg mg/kg	1 0.3	MCERTS MCERTS	17 < 0.3	15 < 0 3	< 0.3	12 < 0.3	< 0.3





#### Analytical Report Number: 18-88220

Project / Site name: Northstowe - Parcel 2A

Lab Sample Number				976854	976855	976856	976857	976858
Sample Reference				BH2A03	BH2A03	BH2A06	BH2A06	BH2A07
Sample Number				1	10	1	7	4
Depth (m)				0.00-0.20	1.50-2.00	0.00-0 20	0.80-1.20	0.20-0.50
Date Sampled				31/05/2018	31/05/2018	31/05/2018	30/05/2018	29/05/2018
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0

Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	-	< 0.1	-	< 0.1
TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	< 0.001	-
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	< 0.001	-
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	< 1 0	-	< 1.0	-
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	< 2 0	-	< 2.0	-
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	< 8.0	< 8 0	-	< 8.0	-
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	< 8.0	< 8 0	-	< 8.0	-
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	< 10	< 10	-	< 10	-
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	< 0.001	< 0.001	-	< 0.001	-
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	< 0.001	-
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	< 1 0	-	< 1.0	-
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	< 2 0	-	< 2.0	-
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	< 10	< 10	-	< 10	-
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	< 10	< 10	-	< 10	-
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	< 10	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	17	-	< 10





### Analytical Report Number: 18-88220

Project / Site name: Northstowe - Parcel 2A

								074040
Lab Sample Number				976859	976860	976861	976862	976863
Sample Reference Sample Number	BH2A07 9	TP2A01 3	TP2A01 15	TP2A02 6	TP2A02 10			
Depth (m)				1.20-1.50	0.00-0.20	1.55-1.70	0.20-0.20	1.10-1.30
Date Sampled				29/05/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content Total mass of sample received	%	N/A 0.001	NONE NONE	16 1.1	6.7 1.2	18 1.1	7.3	18 0.84
	kg	0.001	NONE	1.1	1.2	1.1	1.5	0.04
Asbestos in Soil Screen / Identification Name	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	7.6	8.4	8.8	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate		0.00405		4.5	0.014	0.50	0.014	0.04
Equivalent) Total Organic Carbon (TOC)	g/l %	0.00125	MCERTS MCERTS	1.5	0.014	0.52	0 011 < 0.1	0.24
	70	0.1	PICENTS				< 0.1	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 10	< 1.0	< 1.0	< 1.0
Speciated PAHs		0.05	MORDER	. 0.05	. 0.05	. 0.05	. 0.05	. 0.05
Naphthalene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene Acenaphthene	mg/kg	0 05	MCERTS MCERTS	< 0.05 < 0.05				
Fluorene	mg/kg mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1 2 3-cd)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a h)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH	_	-						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.9	15	11	25	17
Boron (water soluble)	mg/kg	0.2	MCERTS	4.3	0.8	1.4	0.3	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0 2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4 0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	18	34	21	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.8	12	9.9	10	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.3	14	11	7.5	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	15	32	22	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.6	< 1.0	< 1.0	1.8
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	39	63	38	73





Lab Sample Number	976859	976860	976861	976862	976863			
Sample Reference	BH2A07	TP2A01	TP2A01	TP2A02	TP2A02			
Sample Number	9	3	15	6	10			
Depth (m)	1.20-1.50	0.00-0.20	1.55-1.70	0.20-0.20	1.10-1.30			
Date Sampled	29/05/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018			
Time Taken				None Supplied				
nalytical Parameter Soil Analysis)								

Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 10	-	< 1.0	-

Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	< 10	-	< 10	-	< 10
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 10	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	-





Sample Reference         TP2A64         TP2A64         TP2A65         <									
Sample Number         0         3         6         3         3         3           Dets Sampled         0.00-2.0         0.00-2.0         0.00-2.0         0.00-2.0         0.00-2.0           Date Sampled         0.00-2.0 <th>Lab Sample Number</th> <th></th> <th></th> <th></th> <th>976864</th> <th>976865</th> <th>976866</th> <th>976867</th> <th>976868</th>	Lab Sample Number				976864	976865	976866	976867	976868
Depth (m)         0.00-0.75         0.15-0.30         0.00-0.75         0.15-0.30         0.00-0.75 <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>									
Date Sampled					-	-	-	-	-
Time Time         None Supplied         None Supplie									
			r		None Supplied	None Supplied	None Supplieu	None Supplied	None Supplied
Note         N/A         N/A <th></th> <th>Units</th> <th>Limit of detection</th> <th>Accreditation Status</th> <th></th> <th></th> <th></th> <th></th> <th></th>		Units	Limit of detection	Accreditation Status					
	Stone Content	%	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total mass of sample received         Ho         0.001         NONE         1.2         1.4         1.1         1.2         1.1           Asbestos in Soil Soreen / Identification Name         Type         N/A         ISO 17025         -         -         Chrysotle         -	Moisture Content		N/A		10	5.5	9.2	16	13
Aberbasis is of all         Interfactor         Not-detected         Not-det		kg	0.001	NONE	1.2	1.4	1.1	1.2	1.1
Aberbasis is of all         Interfactor         Not-detected         Not-det	•								
Absentso Quantification Total         %         0.001         ISO 17025         -         -         0.003         -         -           General Lonzanics         bit Jutionated         pt Jutionated         pt Jutionated         (1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	Asbestos in Soil Screen / Identification Name	Туре	N/A	ISO 17025	-	-	Chrysotile	-	-
Asbestos Quantification Total         %         0.001         ISO 17025         -         -         0.003         -         -           General Longanics         ptilants         NA         MCRTS         8.5         8.4         8.4         7.5         8.1           Total Cyanide         mg/hg         1         MCRTS         S.5         8.4         8.4         7.5         8.1           Total Cyanide         mg/hg         1         MCRTS         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1         <.1 <td>Asbestos in Soil</td> <td>Туре</td> <td>N/A</td> <td>ISO 17025</td> <td>Not-detected</td> <td>Not-detected</td> <td>Detected</td> <td>Not-detected</td> <td>Not-detected</td>	Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.003	-	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.003	-	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $									
		-	r	r	1				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			· · · ·						
Water Soluble SO4 16/r extraction (2:1 Leachate         ql         0.00125         MCERTS         0.0063         0.0097         0.34         1.7         0.041           Total Organic Carbon (TOC)         %         0.1         MCERTS         -									
	Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
		~ /l	0.00125	MCEDIC	0.0062	0.0007	0.24	17	0.041
Total Phenols         Imaging         1         MCERTS         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0					0.0065	0.0097	0.54	1./	0.041
	Total Organic Carbon (TOC)	70	0.1	MCER13	-	-	_	-	-
Total Phenols (monohydric)         mg/kg         1         MCERTS         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.	Total Phenois								
Speciated PAHs           Naphthalene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         1.9         < 0.05         < 0.05           Acenaphthylene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         1.4         < 0.05         < < 0.05           Acenaphthylene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         < 0.05         < < 0.05           Fluorene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         < < 0.05         < < 0.05           Phenanthrene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05         < < 0.05 <t< td=""><td></td><td>ma/ka</td><td>1</td><td>MCERTS</td><td>&lt; 1.0</td><td>&lt; 1.0</td><td>&lt; 1.0</td><td>&lt; 1.0</td><td>&lt; 1.0</td></t<>		ma/ka	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         1.9         < 0.05         < 0.05           Acenaphthylene         mg/kg         0.05         MCERTS         < 0.05		iiig/kg	-	PICENTS	< 1.0	<b>N</b> 10	< 1.0	< 1.0	< 1.0
Naphthalene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         1.9         < 0.05         < 0.05           Acenaphthylene         mg/kg         0.05         MCERTS         < 0.05	Speciated PAHs								
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		ma/ka	0.05	MCERTS	< 0.05	< 0.05	1.9	< 0.05	< 0.05
Acenaphthene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         29         < 0.05         < 0.05           Fluorene         mg/kg         0.05         MCERTS         < 0.05									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Fluorene		0 05	MCERTS	< 0.05	< 0.05	17	< 0.05	< 0.05
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	0.15	190	< 0 05	< 0.05
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	57	< 0.05	< 0.05
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	0.27	270	< 0 05	< 0.05
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Pyrene	mg/kg	0 05	MCERTS	< 0.05	0.25	210	< 0 05	< 0.05
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	0.13	110	< 0 05	< 0.05
Benzo(k)fluoranthene         mg/kg         0.05         MCERTS         < 0.05         < 0.05         42         < 0.05         < 0.05           Benzo(a)pyrene         mg/kg         0.05         MCERTS         < 0.05	Chrysene	mg/kg	0 05	MCERTS	< 0.05	0.20	95	< 0 05	< 0.05
Benzo(a)pyrene         mg/kg         0.05         MCERTS $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ $< 0.05$ <	Benzo(b)fluoranthene	mg/kg		MCERTS				< 0.05	< 0.05
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		mg/kg		MCERTS					
Dibenz(a h)anthracene $mg/k_0$ 0.05         MCERTS         < 0.05         < 0.05         12         < 0.05         < 0.05           Benzo(ghi)perylene $mg/kg$ 0.05         MCERTS         < 0.05									
Benzo(ghi)perylene         mg/kg         0 05         MCERTS         < 0.05         < 6.05         46         < 0.05         < 0.05           Total PAH           Speciated Total EPA-16 PAHs         mg/kg         0.8         MCERTS         < 0.80									
Total PAH         Speciated Total EPA-16 PAHs       mg/kg       0.8       MCERTS       < 0.80       1.00       1330       < 0.80       < 0.80         Heavy Metals / Metalloids         Arsenic (aqua regia extractable)       mg/kg       1       MCERTS       17       22       15       8.7       11         Boron (water soluble)       mg/kg       0.2       MCERTS       0.5       0.6       0.6       3.0       1.5         Cadmium (aqua regia extractable)       mg/kg       0.2       MCERTS       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2       < 0.2				1					
Speciated Total EPA-16 PAHs         mg/kg         0.8         MCERTS         < 0.80         1.00         1330         < 0.80         < 0.80           Heavy Metals / Metalloids           Arsenic (aqua regia extractable)         mg/kg         1         MCERTS         17         22         15         8.7         11           Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         < 0.2	Benzo(ghi)perylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	46	< 0.05	< 0.05
Speciated Total EPA-16 PAHs         mg/kg         0.8         MCERTS         < 0.80         1.00         1330         < 0.80         < 0.80           Heavy Metals / Metalloids           Arsenic (aqua regia extractable)         mg/kg         1         MCERTS         17         22         15         8.7         11           Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         < 0.2	T-1-1 DAU								
Heavy Metals / Metalloids           Arsenic (aqua regia extractable)         mg/kg         1         MCERTS         17         22         15         8.7         11           Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         <0.2			0.0		. 0.00	1.00	1222		. 0.00
Arsenic (aqua regia extractable)         mg/kg         1         MCERTS         17         22         15         8.7         11           Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         <0.2	Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	1.00	1330	< 0 80	< 0.80
Arsenic (aqua regia extractable)         mg/kg         1         MCERTS         17         22         15         8.7         11           Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         <0.2	Hoovy Motols / Motolloida								
Boron (water soluble)         mg/kg         0.2         MCERTS         0.5         0.6         0.6         3.0         1.5           Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         < 0.2		malka	1	MCEDIC	17	22	15	87	11
Cadmium (aqua regia extractable)         mg/kg         0.2         MCERTS         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         < 0.2         <0.2         <0.2 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									
Chromium (hexavalent)         mg/kg         4         MCERTS         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 4.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0         < 1.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
Chromium (aqua regia extractable)         mg/kg         1         MCERTS         28         21         22         26         31           Copper (aqua regia extractable)         mg/kg         1         MCERTS         9.9         15         21         8.0         19           Lead (aqua regia extractable)         mg/kg         1         MCERTS         11         27         840         11         19           Mercury (aqua regia extractable)         mg/kg         0.3         MCERTS         < 0.3									
Copper (aqua regia extractable)         mg/kg         1         MCERTS         9.9         15         21         8.0         19           Lead (aqua regia extractable)         mg/kg         1         MCERTS         11         27         840         11         19           Mercury (aqua regia extractable)         mg/kg         0.3         MCERTS         <0.3									
Lead (aqua regia extractable)         mg/kg         1         MCERTS         11         27         840         11         19           Mercury (aqua regia extractable)         mg/kg         0.3         MCERTS         < 0.3									
Mercury (aqua regia extractable)         mg/kg         0.3         MCERTS         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3         < 0.3									
Nickel (aqua regia extractable)         mg/kg         1         MCERTS         24         23         19         17         21           Selenium (aqua regia extractable)         mg/kg         1         MCERTS         <1.0									
Selenium (aqua regia extractable)     mg/kg     1     MCERTS     < 1.0     < 1.0     < 1.0     < 1.0									
	Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	49	84	29	64





Lab Sample Number		976864	976865	976866	976867	976868		
Sample Reference				TP2A04	TP2A05	TP2A06	TP2A06	TP2A08
Sample Number				3	6	3	3	3
Depth (m)				0.00-0.25	0.15-0.30	0.00-0 30	1.20-1.50	0.00-0.20
Date Sampled				01/06/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018
Time Taken				None Supplied				
	Γ			None Supplied	None Supplied	None Supplieu	None Supplied	None Supplied
		۹_	Accreditation Status					
Analytical Parameter	Ę	Limit of detection	creditat Status					
(Soil Analysis)	Units	ti if	tu ita					
		S S	° tio					
			n					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	< 1.0
Petroleum Hydrocarbons		0.1	MORDER	- 0.1				. 0.1
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH6 - Aliphatic (C6 - C8)		0.001	MOEDTO				0.001	
	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH6 - Aliphatic (C21 - C35) TPH6 - Aliphatic (C6 - C35)	mg/kg mg/kg	8 10	MCERTS NONE	-	-		< 8.0 < 10	-
TPHO - Aliphatic (Co - C35)	IIIg/kg	10	NONE	-	-	-	< 10	-
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	-	-	-	< 0.001	
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS		-		< 10	-
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	-	-	-	< 10	-
	iiig/kg	10	NONE				< 10	
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aliphatic > EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	3.0	-	< 1.0
TPH-CWG - Aliphatic > EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	20	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	57	-	< 8.0
TPH-CWG - Aliphatic > EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	160	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	240	-	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 10	8.3	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2 0	230	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	1200	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	2000	-	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	3500	-	< 10





Lab Sample Number				976869	976870	976871	976872	976873
Sample Reference				TP2A08	TP2A09	TP2A09	TP2A10	TP2A10
Sample Number				9	1	10	6	9
Depth (m)				0.50-0.70	0.00-0.25	1.00-1 20	0.25-0.60	0.60-1.20
Date Sampled				30/05/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018
Time Taken	-	1		None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	17	16	17	19
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.0	0.59	0.99
					•			
Asbestos in Soil Screen / Identification Name	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics							<b>a</b> -	
pH - Automated	pH Units	N/A	MCERTS	7.7	8.1	8.4	8.3	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide Water Soluble SO4 16hr extraction (2:1 Leachate	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Equivalent)	g/l	0.00125	MCERTS	2.3	0.022	0.17	0 070	0.40
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	1.0	-	-	-
	70	0.1	TICERTO		1.0			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05	< 0.05	< 0.05 < 0.05
Benzo(k)fluoranthene Benzo(a)pyrene	mg/kg	0 05	MCERTS MCERTS	< 0.05	< 0.05	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05
Indeno(1 2 3-cd)pyrene	mg/kg mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a h)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Series (grifper fielde	iiig/Ng	0.00	TICLICIT	× 0.05	× 0.03	× 0.03	× 0.03	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	16	8.7	19	19
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	2.4	2.4	3.0	4.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0 2	< 0.2	< 0.2	< 0.2
Caumum (aqua regia extractable)			MOEDTO	< 4.0	< 4 0	< 4.0	< 4.0	< 4.0
Chromium (hexavalent)	mg/kg	4	MCERTS	< 1.0				
Chromium (hexavalent) Chromium (aqua regia extractable)	mg/kg mg/kg	4	MCERTS	32	38	27	49	53
Chromium (hexavalent) Chromium (aqua regia extractable) Copper (aqua regia extractable)				32 8.4	38 13	27 6.5	49 13	53 16
Chromium (hexavalent) Chromium (aqua regia extractable) Copper (aqua regia extractable) Lead (aqua regia extractable)	mg/kg	1 1 1	MCERTS MCERTS MCERTS	32 8.4 10	38 13 16	27 6.5 7.2	49 13 15	16 14
Chromium (hexavalent) Chromium (aqua regia extractable) Copper (aqua regia extractable) Lead (aqua regia extractable) Mercury (aqua regia extractable)	mg/kg mg/kg mg/kg mg/kg	1 1	MCERTS MCERTS MCERTS MCERTS	32 8.4 10 < 0.3	38 13 16 < 0 3	27 6.5 7.2 < 0.3	49 13 15 < 0.3	16 14 < 0.3
Chromium (hexavalent) Chromium (aqua regia extractable) Copper (aqua regia extractable) Lead (aqua regia extractable) Mercury (aqua regia extractable) Nickel (aqua regia extractable)	mg/kg mg/kg mg/kg mg/kg mg/kg	1 1 0.3 1	MCERTS MCERTS MCERTS MCERTS MCERTS	32 8.4 10 < 0.3 23	38 13 16 < 0 3 25	27 6.5 7.2 < 0.3 17	49 13 15 < 0.3 36	16 14 < 0.3 40
Chromium (hexavalent) Chromium (aqua regia extractable) Copper (aqua regia extractable) Lead (aqua regia extractable) Mercury (aqua regia extractable)	mg/kg mg/kg mg/kg mg/kg	1 1 1 0.3	MCERTS MCERTS MCERTS MCERTS	32 8.4 10 < 0.3	38 13 16 < 0 3	27 6.5 7.2 < 0.3	49 13 15 < 0.3	16 14 < 0.3





Lab Sample Number	ab Sample Number					976871	976872	976873
Sample Reference	TP2A08	TP2A09	TP2A09	TP2A10	TP2A10			
Sample Number	9	1	10	6	9			
Depth (m)	0.50-0.70	0.00-0.25	1.00-1 20	0.25-0.60	0.60-1.20			
Date Sampled	30/05/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018			
Time Taken				None Supplied				
Accreditation Accreditation Status Units								

Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1 0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 10	-	< 1.0	-

Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	< 10	-	< 10	-	< 10
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 10	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 10	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	< 10	-	< 10	-





Lab Sample Number				976874 TPSA2A03	976875 TPSA2A03	976876 TPSA2A07	976877 TPSA2A07	
Sample Reference Sample Number				<u>1PSAZA03</u>	1PSA2A03 6	1PSAZA07 3	1PSA2A07 9	
Depth (m)				0.00-0.20	0.50-0.60	0.00-0.15	0.50-0.70	
Date Sampled				31/05/2018	31/05/2018	29/05/2018	29/05/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	7.7	6.5	14	19	
Total mass of sample received	kg	0.001	NONE	1.3	1.5	1.1	1.2	
							•	
Asbestos in Soil Screen / Identification Name	Туре	N/A	ISO 17025	-	-	-	-	
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	
General Inorganics	w1111-9	N1/A	MCEDIC	0.7	07	7.2	0.1	]
pH - Automated Total Cyanide	pH Units mg/kg	N/A 1	MCERTS MCERTS	<u>8.2</u> < 1	8.7 < 1	7.3	8.1 < 1	
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate	шу/ку	1	MCERIS		< I	< I		
Equivalent)	g/l	0.00125	MCERTS	0.012	0.0097	0.024	0.18	
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	
Total Phenois	-	7						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	< 1.0	
Speciated PAHs		0.05		0.05	0.05	0.05	0.05	
Naphthalene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene Fluorene	mg/kg mg/kg	0 05	MCERTS MCERTS	< 0.05 < 0.05	< 0.05 < 0.05	< 0.05	< 0.05 < 0.05	
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1 2 3-cd)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a h)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total DAH								
Total PAH Speciated Total EPA-16 PAHs	m = //-=	0.8	MCERTS	< 0.90	< 0.80	~ 0.90	< 0.80	
Specialeu Tulai EPA-10 PARS	mg/kg	0.8	PILERIS	< 0.80	< 0.80	< 0.80	< U.ðU	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	32	19	16	15	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	< 0 2	1.9	3.5	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0 2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4 0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	15	39	50	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.9	5.6	27	12	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	6.5	30	15	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0 3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	15	26	31	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	44	27	92	67	





Lab Sample Number				976874	976875	976876	976877	
Sample Reference				TPSA2A03	TPSA2A03	TPSA2A07	TPSA2A07	
Sample Number	Sample Number					3	9	
Depth (m)	0.00-0.20	0.50-0.60	0.00-0.15	0.50-0.70				
Date Sampled	31/05/2018	31/05/2018	29/05/2018	29/05/2018				
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	< 1.0	-	
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	
	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	
Ethylbenzene			MOEDTO	< 1.0	-	< 1.0	-	
	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene p & m-xylene o-xylene	µg/kg µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	

Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	
TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	-	< 10	-	< 1.0	
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	-	< 8 0	-	< 8.0	
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	-	< 10	-	< 10	
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	-	< 0.001	-	< 0.001	
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	-	< 10	-	< 1.0	
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	-	< 2 0	-	< 2.0	
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	-	< 10	-	< 10	
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	-	< 10	-	< 10	
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	-	< 10	-	< 10	
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	< 10	-	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	< 10	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	< 10	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	< 10	-	





Analytical Report Number: 18-88220 Project / Site name: Northstowe - Parcel 2A Your Order No:

# **Certificate of Analysis - Asbestos Quantification**

## **Methods:**

## **Qualitative Analysis**

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

## **Quantitative Analysis**

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
976866	TP2A06	0.00-0.30	130	Loose Fibrous Debris	Chrysotile	0.003	0.003

Both Qualitative and Quantitative Analyses are UKAS accredited.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.





#### Project / Site name: Northstowe - Parcel 2A

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
976854	BH2A03	1	0.00-0.20	Brown loam and clay with vegetation and gravel
976855	BH2A03	10	1.50-2.00	Grey clay with gravel.
976856	BH2A06	1	0.00-0.20	Brown loam and clay with vegetation and gravel
976857	BH2A06	7	0.80-1.20	Brown clay and sand with gravel.
976858	BH2A07	4	0.20-0.50	Brown clay.
976859	BH2A07	9	1.20-1.50	Brown clay with gravel.
976860	TP2A01	3	0.00-0.20	Brown loam and sand with vegetation and gravel.
976861	TP2A01	15	1.55-1.70	Grey clay.
976862	TP2A02	6	0.20-0.20	Light brown sand with gravel.
976863	TP2A02	10	1.10-1.30	Brown clay.
976864	TP2A04	3	0.00-0.25	Light brown sandy clay with gravel.
976865	TP2A05	6	0.15-0.30	Light brown loam and sand with gravel and vegetation.
976866	TP2A06	3	0.00-0.30	Brown sandy loam with gravel and vegetation.
976867	TP2A06	3	1.20-1.50	Grey clay and sand with chalk.
976868	TP2A08	3	0.00-0.20	Brown clay and loam with vegetation and gravel
976869	TP2A08	9	0.50-0.70	Grey clay.
976870	TP2A09	1	0.00-0.25	Brown clay.
976871	TP2A09	10	1.00-1.20	Grey clay.
976872	TP2A10	6	0.25-0.60	Brown clay with chalk.
976873	TP2A10	9	0.60-1.20	Brown clay.
976874	TPSA2A03	3	0.00-0.20	Brown sand with gravel.
976875	TPSA2A03	6	0.50-0.60	Light brown sand with gravel.
976876	TPSA2A07	3	0.00-0.15	Brown clay with gravel.
976877	TPSA2A07	9	0.50-0.70	Brown clay with chalk.





Project / Site name: Northstowe - Parcel 2A

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name Analytical Method Description		Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC- MS.	In-house method based on USEPA8260	L073B-PL	w	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone $> 10 \text{ mm}$ as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE





Project / Site name: Northstowe - Parcel 2A

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP- OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP- OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH6 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method	L076-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Sample D	Other_ D Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH2A03	1 S	18-88220	976854	с	Total cyanide in soil	L080-PL	с
BH2A03	10 S	18-88220	976855	с	Total cyanide in soil	L080-PL	с
BH2A06	1 S	18-88220	976856	с	Total cyanide in soil	L080-PL	С
BH2A06	7 S	18-88220	976857	С	Total cyanide in soil	L080-PL	С
BH2A07	4 S	18-88220	976858	с	Total cyanide in soil	L080-PL	С
BH2A07	9 S	18-88220	976859	С	Total cyanide in soil	L080-PL	С
TP2A05	6 S	18-88220	976865	с	Total cyanide in soil	L080-PL	с
TP2A06	3 S	18-88220	976866	с	Total cyanide in soil	L080-PL	С
TP2A06	3 S	18-88220	976867	С	Total cyanide in soil	L080-PL	С
TP2A08	3 S	18-88220	976868	с	Total cyanide in soil	L080-PL	С
TP2A08	9 S	18-88220	976869	с	Total cyanide in soil	L080-PL	С
TPSA2A03	3 S	18-88220	976874	с	Total cyanide in soil	L080-PL	С
TPSA2A03	6 S	18-88220	976875	с	Total cyanide in soil	L080-PL	с
TPSA2A07	3 S	18-88220	976876	С	Total cyanide in soil	L080-PL	С
TPSA2A07	9 S	18-88220	976877	С	Total cyanide in soil	L080-PL	С



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# Analytical Report Number : 18-88767

Replaces Analytical Report Number : 18-88767, issue no. 1

Project / Site name:	Northstowe - Parcel 2A	Samples received on:	05/06/2018
Your job number:	10018973	Samples instructed on:	13/06/2018
Your order number:		Analysis completed by:	21/06/2018
Report Issue Number:	2	Report issued on:	27/07/2018
Samples Analysed:	6 soil samples		



Reporting Manager For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Lab Sample Number		980324	980325	980326	980327	980328		
Sample Reference				BH2A01	BH2A02	BH2A04	BH2A04	BH2A05
Sample Number				24	26	28	31	28
Depth (m)				0.00-0.50	0.50-1.00	0.00-0 50	1.50-2.00	0.00-0.20
Date Sampled				01/06/2018	05/06/2018	05/06/2018	05/06/2018	05/06/2018
Time Taken			-	None Supplied				
		~	Accreditation Status					
Analytical Parameter	ç	Limit of detection	St g					
(Soil Analysis)	Units	ecti	atu dita					
	63	9 9 P	stio					
			ă					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.9	12	15	18	9.7
Total mass of sample received	kg	0.001	NONE	1.5	1.4	0.98	0.98	1.0
r		r	r				r	
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.3	7.9	6.7	7.6
Total Cyanide	mg/kg	1 N/A	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	<1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate	ilig/kg	-	MCERTS		< I		< 1	
Equivalent)	g/l	0.00125	MCERTS	0.0065	0.023	0.067	1.8	0.0086
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	0.5	-	1.6
Total Phenols	-	-						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	< 1.0	< 1.0
Speciated PAHs	-	r					1	
Naphthalene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a h)anthracene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0 05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
	1 119/Ng	0.0	TICENTS	\$ 0.00	\$ 0.00	- 0.00	- 0.00	10.00
Heavy Metals / Metalloids	_	•	•					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	10	18	9.0	16
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.9	2.4	4.9	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0 2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4 0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	14	35	24	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.2	7.0	21	13	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.9	5.3	13	13	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0 3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	15	30	24	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 10	< 1.0	1.2	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	28	19	47	53	55





#### Project / Site name: Northstowe - Parcel 2A

Lab Sample Number				980324	980325	980326	980327	980328
Sample Reference				BH2A01	BH2A02	BH2A04	BH2A04	BH2A05
Sample Number				24	26	28	31	28
Depth (m)				0.00-0.50	0.50-1.00	0.00-0 50	1.50-2.00	0.00-0.20
Date Sampled				01/06/2018	05/06/2018	05/06/2018	05/06/2018	05/06/2018
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics			-					
Benzene	ug/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-

#### Petroleum Hydrocarbons

TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	-	-	-	< 10	< 10
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	-	-	-	< 0.001	< 0.001
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	-	-	-	< 10	< 10
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	-	-	-	< 10	< 10
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	-	-	-	< 10	< 10
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 10	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2 0	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8 0	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8 0	< 8.0	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1 0	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2 0	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	-	-





Lab Sample Number	980329							
Sample Reference		BH2A05						
Sample Number	36							
Depth (m)				1.50-2.00				
Date Sampled		05/06/2018						
Time Taken				None Supplied				
			A					
		융	Accreditation Status					
Analytical Parameter	Units	te mi	ed Sta					
(Soil Analysis)	its	Limit of detection	itat					
			ion					
Change Cambanh	<i></i>	0.1		. 0.1				
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	23				
Total mass of sample received	kg	0.001	NONE	1.2				
Ashestes in Call	-	N1/A	100 17005	Not data at a		r	1	,
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected				
Comment Terrorenting								
General Inorganics		N1/4		7.0		1	1	, P
pH - Automated	pH Units	N/A	MCERTS	7.8		1		┨─────┤
Total Cyanide	mg/kg	1	MCERTS	< 1		1		
Free Cyanide	mg/kg	1	MCERTS	< 1		I		
Water Soluble SO4 16hr extraction (2:1 Leachate	<i>a</i> //	0.00125	MCEDIC	0.11				
Equivalent) Total Organic Carbon (TOC)	g/l %	0.00125	MCERTS	0.11		1		
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Total Phenois								
				1.0		1		-
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Creater d DAILs								
Speciated PAHs						1		
Naphthalene	mg/kg	0 05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0 05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0 05	MCERTS	< 0.05				
Fluorene	mg/kg	0 05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0 05	MCERTS	< 0.05				
Anthracene	mg/kg	0 05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0 05	MCERTS	< 0.05				
Pyrene	mg/kg	0 05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0 05	MCERTS	< 0.05				
Chrysene	mg/kg	0 05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0 05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0 05	MCERTS	< 0.05		1		
Benzo(a)pyrene	mg/kg	0 05	MCERTS	< 0.05		1		
Indeno(1,2,3-cd)pyrene	mg/kg	0 05	MCERTS	< 0.05				
Dibenz(a h)anthracene	mg/kg	0 05	MCERTS	< 0.05		1		
Benzo(ghi)perylene	mg/kg	0 05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13		I		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13		1		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3		1		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26		1	1	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.3		1	1	1
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57		1	1	1 1
	mg/ng		HOLNIJ	51	1			a





#### Project / Site name: Northstowe - Parcel 2A

Lab Sample Number				980329		
Sample Reference				BH2A05		
Sample Number	36					
Depth (m)	1.50-2.00					
Date Sampled				05/06/2018		
Time Taken				None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Monoaromatics						
Benzene	ug/kg	1	MCERTS	-		
Toluene	µg/kg	1	MCERTS	-		
Ethylbenzene	µg/kg	1	MCERTS	-		
p & m-xylene	µg/kg	1	MCERTS	-		
o-xylene	µg/kg	1	MCERTS	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-		

#### Petroleum Hydrocarbons

TPH6 - Aliphatic (C6 - C8)	mg/kg	0.001	MCERTS	< 0.001		
TPH6 - Aliphatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001		
TPH6 - Aliphatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0		
TPH6 - Aliphatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0		
TPH6 - Aliphatic (C16 - C21)	mg/kg	8	MCERTS	< 8.0		
TPH6 - Aliphatic (C21 - C35)	mg/kg	8	MCERTS	< 8.0		
TPH6 - Aliphatic (C6 - C35)	mg/kg	10	NONE	< 10		
TPH6 - Aromatic (C6 - C8)	mg/kg	0.001	NONE	< 0.001		
TPH6 - Aromatic (C8 - C10)	mg/kg	0.001	MCERTS	< 0.001		
TPH6 - Aromatic (C10 - C12)	mg/kg	1	MCERTS	< 1.0		
TPH6 - Aromatic (C12 - C16)	mg/kg	2	MCERTS	< 2.0		
TPH6 - Aromatic (C16 - C21)	mg/kg	10	MCERTS	< 10		
TPH6 - Aromatic (C21 - C35)	mg/kg	10	MCERTS	< 10		
TPH6 - Aromatic (C6 - C35)	mg/kg	10	NONE	< 10		
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	 	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	 	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-		





#### Project / Site name: Northstowe - Parcel 2A

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
980324	BH2A01	24	0.00-0.50	Light brown sandy clay with gravel.
980325	BH2A02	26	0.50-1.00	Light brown sandy clay with gravel and vegetation.
980326	BH2A04	28	0.00-0.50	Light brown clay and sand with gravel.
980327	BH2A04	31	1.50-2.00	Brown clay.
980328	BH2A05	28	0.00-0.20	Brown loam and clay with gravel and vegetation.
980329	BH2A05	36	1.50-2.00	Brown clay and sand.





Project / Site name: Northstowe - Parcel 2A

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

					r
Analytical Test Name Analytical Method Description		Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.		In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC- MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP- OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP- OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH6 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method	L076-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 18-88767-2 Northstowe - Parcel 2A 10018973

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Sample D	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH2A01	24	S	18-88767	980324	с	Total cyanide in soil	L080-PL	с
BH2A02	26	S	18-88767	980325	с	Total cyanide in soil	L080-PL	с
BH2A04	28	S	18-88767	980326	с	Total cyanide in soil	L080-PL	с
BH2A04	31	S	18-88767	980327	с	Total cyanide in soil	L080-PL	с
BH2A05	28	S	18-88767	980328	с	Total cyanide in soil	L080-PL	с
BH2A05	36	S	18-88767	980329	с	Total cyanide in soil	L080-PL	С



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# Analytical Report Number : 18-90064

Replaces Analytical Report Number : 18-90064, issue no. 2

Project / Site name:	Northstowe - Parcel 2A	Samples received on:	25/06/2018
Your job number:	10018973	Samples instructed on:	25/06/2018
Your order number:	14011783	Analysis completed by:	24/07/2018
Report Issue Number:	3	Report issued on:	27/07/2018
Samples Analysed:	18 water samples		



Reporting Manager For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	<ul> <li>4 weeks from reporting</li> </ul>
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.





Your Order No: 14011783								
Lab Sample Number				987851	987852	987853	987854	987855
Sample Reference				BH2A01	BH2A01	BH2A02	BH2A02	BH2A03
Sample Number				None Supplied				
Depth (m)				2.50	7.00	2.20	8.00	5.00
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pН	pH Units	N/A	ISO 17025	7.3	7.7	7.4	7.3	7.1
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO₄	µg/l	45	ISO 17025	277000	542000	114000	527000	382000
Sulphate as SO <sub>4</sub>	mg/l	0.045	ISO 17025	277	542	114	527	382
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.68	6.34	5.79	4.31	6.00
Alkalinity	mgCaCO3/I	3	ISO 17025	450	490	510	470	570
Total Phenols	<u> </u>							
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH						<i></i>		
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.47	1.19	0.28	0.43	0.53
Boron (dissolved)	µg/l	10	ISO 17025	530	780	130	680	300
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.03	< 0.02	< 0.02
Calcium (dissolved)	mg/l		ISO 17025	140	110	150	160	170
Chromium (hexavalent) Chromium (dissolved)	µg/l	5	ISO 17025	< 50	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0 2 0.7	0.9	0.2 3.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.2	0.7	0.3	2.1 < 0.2	< 0.2
Lead (dissolved) Mercury (dissolved)	µg/l	0.2	ISO 17025 ISO 17025	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05
Nickel (dissolved)	µg/l	0.05	ISO 17025 ISO 17025	2.0	2.9	< 0.05	< 0.05 1.3	< 0.05 4.4
Selenium (dissolved)	µg/l	0.5	ISO 17025 ISO 17025	2.0	4.3	0.5	24	4.4
Zinc (dissolved)	μg/l μg/l	0.6	ISO 17025 ISO 17025	9.4	3.0	2.4	6.2	7.5
	µy/i	0.0	130 17025	2.7	5.0	2.7	0.2	7.5





Project / Site name: Northstowe - Parcel 2A

Your Order No: 14011783								
Lab Sample Number		987851	987852	987853	987854	987855		
Sample Reference	BH2A01	BH2A01	BH2A02	BH2A02	BH2A03			
Sample Number				None Supplied				
Depth (m)				2.50	7.00	2.20	8.00	5.00
Date Sampled	21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018			
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0

#### Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample





Your Order No: 14011783								
Lab Sample Number				987856	987857	987858	987859	987860
Sample Reference				BH2A03	BH2A04	BH2A04	BH2A05	BH2A05
Sample Number				None Supplied 15.00	None Supplied 3.00	None Supplied 15.00	None Supplied 2.50	None Supplied 15.00
Depth (m)				21/06/2018	21/06/2018	21/06/2018	2.50	21/06/2018
Date Sampled Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
		de E	Accreditation Status					
Analytical Parameter	Units	Limit of detection	creditat Status					
(Water Analysis)	ស	tio of	tati us					
		-	On O					
General Inorganics				- 4	7.4	7.0	7.0	7.4
pH Tatal Cranida	pH Units	N/A 10	ISO 17025 ISO 17025	7.1	7.4	7.2	7.0	7.4
Total Cyanide Free Cyanide	μg/l μg/l	10	ISO 17025 ISO 17025	< 10	< 10 < 10	< 10 < 10	< 10 < 10	< 10
Sulphate as SO <sub>4</sub>	μg/l	45	ISO 17025	731000	747000	403000	586000	973000
Sulphate as SO <sub>4</sub>	mg/l	0.045	ISO 17025	731	747	403	586	973
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	3.20	-	-	5.26	6.66
Alkalinity	mgCaCO3/I	3	ISO 17025	480	250	250	500	390
Total Phenois		10	100 (700-	. 10	. 10	. 10	. 10	. 10
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene Benzo(a)anthracene	μg/l μg/l	0.01	ISO 17025 ISO 17025	< 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01 < 0.01	< 0.01
Chrysene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µq/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
	P.9/	0110	100 17020				. 0120	. 0110
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.42	0.39	0.24	0.36	0.70
Boron (dissolved)	µg/l	10	ISO 17025	550	560	190	250	720
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0 02	0.06	< 0.02
Calcium (dissolved) Chromium (hexavalent)	mg/l	0.012	ISO 17025 ISO 17025	250	- < 5.0	-	300	240
Chromium (nexavalent) Chromium (dissolved)	μg/l μg/l	0.2	ISO 17025 ISO 17025	< 5 0 < 0 2	< 5.0	< 5.0 < 0.2	< 5.0 0.5	< 5.0 < 0.2
Copper (dissolved)	μg/l	0.2	ISO 17025	0.6	0.7	1.2	2.4	1.9
Lead (dissolved)	μg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	μg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	μg/l	0.5	ISO 17025	0.9	0.9	< 0.5	3.0	3.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	2.7	2.8	4.3	2.1	46
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.3	4.7	1.1	6.7	5.6





Project / Site name: Northstowe - Parcel 2A

Your Order No: 14011783								
Lab Sample Number	987856	987857	987858	987859	987860			
Sample Reference				BH2A03	BH2A04	BH2A04	BH2A05	BH2A05
Sample Number				None Supplied				
Depth (m)	15.00	3.00	15.00	2.50	15.00			
Date Sampled	21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018			
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0

#### Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample





Your Order No: 14011783								
Lab Sample Number				987861	987862	987863	987864	987865
Sample Reference				BH2A06	BH2A06	BH2A07	BH2A07	BH1003S
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	7.00	3.00	10.00	3.60
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.1	7.2	7.1	7.1	7.2
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO <sub>4</sub>	µg/l	45	ISO 17025	1310000	1310000	2030000	2400000	500000
Sulphate as SO <sub>4</sub>	mg/l	0.045	ISO 17025	1310	1310	2030	2400	500
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	7.40	3.11	-	-	3.42
Alkalinity	mgCaCO3/I	3	ISO 17025	530	470	230	580	520
Total Phenois			-					
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	μg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0 01	< 0.01	< 0.01
Total PAH						<i>a</i> : -		
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.46	0.36	0.22	0.59	< 0.15
Boron (dissolved)	µg/l	10	ISO 17025	210	820	410	780	130
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.04	0.02	< 0.02
Calcium (dissolved)	mg/l		ISO 17025	470	370	-	-	270
Chromium (hexavalent)	µg/l	5 0.2	ISO 17025	< 50	< 5.0	< 5.0 0.3	< 5.0	< 5.0 < 0.2
Chromium (dissolved) Copper (dissolved)	µg/l	0.2	ISO 17025 ISO 17025	< 0 2 < 0 5	< 0.2 2.0	1.8	0.9 1.5	2.2
Lead (dissolved)	µg/l	0.5	ISO 17025 ISO 17025	< 0.2	0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	μg/l μg/l	0.2	ISO 17025 ISO 17025	< 0.05	< 0.05	< 0.2	< 0.2	< 0.2
Nickel (dissolved)	μg/I μg/I	0.05	ISO 17025	1.4	2.8	0.7	4.9	0.9
Selenium (dissolved)	μg/I μg/I	0.5	ISO 17025	3.8	2.0	5.2	6.4	2.5
Zinc (dissolved)	μg/l	0.5	ISO 17025	9.2	5.0	13	11	1.8





Project / Site name: Northstowe - Parcel 2A

Your Order No: 14011783								
Lab Sample Number				987861	987862	987863	987864	987865
Sample Reference				BH2A06	BH2A06	BH2A07	BH2A07	BH1003S
Sample Number				None Supplied				
Depth (m)				2.50	7.00	3.00	10.00	3.60
Date Sampled				21/06/2018	21/06/2018	21/06/2018	21/06/2018	21/06/2018
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0

#### Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample





Your Order No: 14011783								
Lab Sample Number			_	987866	987867	987868		
Sample Reference				BH1003D	BH1103S	BH1103D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				9.00	5.00	9.50		
Date Sampled				21/06/2018	21/06/2018	21/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2	7.8	7.4		
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10		
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10		
Sulphate as SO <sub>4</sub>	µg/l	45	ISO 17025	1060000	115000	107000		
Sulphate as SO <sub>4</sub>	mg/l	0.045	ISO 17025	1060	115	107		
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	3.09	7.12	2.44		
Alkalinity	mgCaCO3/l	3	ISO 17025	470	540	440		
Total Bhanala								
Total Phenols Total Phenols (monohydric)	110/1	10	ISO 17025	< 10	< 10	< 10	I	
Total Phenois (mononyunc)	µg/l	10	150 17025	< 10	< 10	< 10		
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16		
Heavy Metals / Metalloids		0.15	100 1702-	0.27		0.25		
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.27	1.11	0.25		
Boron (dissolved)	µg/l	10	ISO 17025	890	58	320		
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0.02		
Calcium (dissolved)	mg/l		ISO 17025	260	66	95		
Chromium (hexavalent) Chromium (dissolved)	µg/l	5 0.2	ISO 17025 ISO 17025	< 5 0 < 0 2	< 5.0 < 0.2	< 5.0 < 0.2		
Copper (dissolved)	µg/l	0.2	ISO 17025 ISO 17025	1.0	< 0.2 1.7	1.0		
Lead (dissolved)	µg/l	0.5	ISO 17025 ISO 17025	< 0 2	< 0.2	< 0.2		
Mercury (dissolved)	μg/l μg/l	0.2	ISO 17025 ISO 17025	< 0.05	< 0.2	< 0.2		
Nickel (dissolved)	μg/I μg/I	0.05	ISO 17025 ISO 17025	1.5	1.8	0.5		
Selenium (dissolved)	μg/I μg/I	0.5	ISO 17025 ISO 17025	1.5	1.8	< 0.6		
Zinc (dissolved)	μg/I μg/I	0.6	ISO 17025 ISO 17025	1.7	0.6	3.2		
	μ9/1	0.5	130 17025	1./	0.0	J.2		





Project / Site name: Northstowe - Parcel 2A

#### Your Order No: 14011783

Lab Sample Number					987867	987868	
Sample Reference	ample Reference					BH1103D	
ample Number				None Supplied	None Supplied	None Supplied	
Depth (m)	pth (m)			9.00	5.00	9.50	
Date Sampled				21/06/2018	21/06/2018	21/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

#### Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
p & m-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	
o-xylene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µq/l	1	ISO 17025	< 10	< 1.0	< 1.0	

#### Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	

U/S = Unsuitable Sample I/S = Insufficient Sample





Project / Site name: Northstowe - Parcel 2A

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in Water	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	w	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(AI, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Francisco de la completa de la deservación de la del	K' analysis have been carried out in our labora	terre les these likelites d' Kierer de ser			

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom. For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.





Sample D	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH1003D		W	18-90064	987866	С	pH at 20oC in water (automated)	L099-PL	С
BH1003S		W	18-90064	987865	с	pH at 20oC in water (automated)	L099-PL	С
BH1103D		W	18-90064	987868	с	pH at 20oC in water (automated)	L099-PL	С
BH1103S		W	18-90064	987867	С	pH at 20oC in water (automated)	L099-PL	С
BH2A01		W	18-90064	987851	с	pH at 20oC in water (automated)	L099-PL	С
BH2A01		W	18-90064	987852	С	pH at 20oC in water (automated)	L099-PL	С
BH2A02		W	18-90064	987853	с	pH at 20oC in water (automated)	L099-PL	С
BH2A02		W	18-90064	987854	с	pH at 20oC in water (automated)	L099-PL	С
BH2A03		W	18-90064	987855	С	pH at 20oC in water (automated)	L099-PL	С
BH2A03		W	18-90064	987856	с	pH at 20oC in water (automated)	L099-PL	С
BH2A04		W	18-90064	987857	с	pH at 20oC in water (automated)	L099-PL	С
BH2A04		W	18-90064	987858	С	pH at 20oC in water (automated)	L099-PL	С
BH2A05		W	18-90064	987859	с	pH at 20oC in water (automated)	L099-PL	С
BH2A05		W	18-90064	987860	С	pH at 20oC in water (automated)	L099-PL	С
BH2A06		W	18-90064	987861	с	pH at 20oC in water (automated)	L099-PL	С
BH2A06		W	18-90064	987862	С	pH at 20oC in water (automated)	L099-PL	С
BH2A07		W	18-90064	987863	С	pH at 20oC in water (automated)	L099-PL	С
BH2A07		W	18-90064	987864	с	pH at 20oC in water (automated)	L099-PL	С



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# Analytical Report Number : 18-90269

Replaces Analytical Report Number : 18-90269, issue no. 1

Project / Site name:	Northstowe - Parcel 2A	Samples received on:	26/06/2018
Your job number:	10018973	Samples instructed on:	26/06/2018
Your order number:	14011783	Analysis completed by:	04/07/2018
Report Issue Number:	2	Report issued on:	27/07/2018
Samples Analysed:	9 water samples		



Reporting Manager For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Project / Site name: Northstowe - Parcel 2A

Your Order No: 14011783								
Lab Sample Number			988797	988798	988799	988800	988801	
Sample Reference			BH601S	BH601D	BH604S	BH604D	BH606S	
Sample Number			None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled			22/06/2018	22/06/2018	22/06/2018	22/06/2018	22/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.55	5.89	-	-	6.67
Heavy Metals / Metalloids								
Calcium (dissolved)	mg/l	0.012	ISO 17025	470	120	-	-	160
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons TPH-CWG - Aliphatic >C5 - C6		1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	µg/l			-		-		
TPH-CWG - Aliphatic > C6 - C8	µg/l	1	ISO 17025	< 10	< 1.0 < 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 TPH-CWG - Aliphatic >C10 - C12	µg/l µg/l	10	ISO 17025 NONE	< 1 0 < 10	< 1.0	< 1.0 < 10	< 1.0 < 10	< 1.0 < 10
TPH-CWG - Aliphatic >C10 - C12 TPH-CWG - Aliphatic >C12 - C16	µg/I µa/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 TPH-CWG - Aliphatic >C16 - C21	µg/I µg/I	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C10 - C21 TPH-CWG - Aliphatic >C21 - C35	µg/I µg/I	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	μg/i μq/l	10	NONE	< 10	< 10	< 10	< 10	< 10
	µ9/1	10	NONL	× 10	× 10	× 10	× 10	× 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Aromade (65 655)	P9/1	10	NONL	× 10	10	× 10	× 10	10

U/S = Unsuitable Sample I/S = Insufficient Sample





Project / Site name: Northstowe - Parcel 2A

Your Order No: 14011783								
Lab Sample Number			988802	988803	988804	988805		
Sample Reference			BH606D	BH1205S	BH1205D	BH1108		
Sample Number			None Supplied	None Supplied	None Supplied	None Supplied		
Depth (m)			None Supplied	None Supplied	None Supplied	None Supplied		
Date Sampled				22/06/2018	22/06/2018	22/06/2018	22/06/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	2.36	8.04	6.66	3.82	
Heavy Metals / Metalloids								
Calcium (dissolved)	mg/l	0.012	ISO 17025	370	490	400	110	
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 10	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C5 - C7		1	ISO 17025	< 1 0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C5 - C7 TPH-CWG - Aromatic >C7 - C8	µg/l µg/l	1	ISO 17025 ISO 17025	< 10	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C8 - C10	μg/I μg/I	1	ISO 17025 ISO 17025	< 10	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C10 TPH-CWG - Aromatic >C10 - C12	μg/I μg/I	10	NONE	< 10	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C12	μg/I μg/I	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C12 - C16 TPH-CWG - Aromatic >C16 - C21	μg/I μg/I	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C21 - C21	μg/I μg/I	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (C5 - C35)	μg/I	10	NONE	< 10	< 10	< 10	< 10	
	P3/1	10	NUNL	< 10	× 10	< 10	× 10	

U/S = Unsuitable Sample I/S = Insufficient Sample





Project / Site name: Northstowe - Parcel 2A

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



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# **PHASE 2 GEO-ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATION** REPORT

Northstowe, Phase 2, Parcel 2A

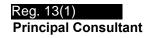
NOR-ARC-P2-xxx-RP-G-0140-P01

AUGUST 2018

Incorporating



# **CONTACTS**





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# PHASE 2 Geo-environmental and Geotechnical Investigation Report

Northstowe, Phase 2, Parcel 2A

Author	Reg. 13(1)
Checker	Reg. 13(1) James Lemon
Approver	Reg. 13(1)
Report No	NOR-ARC-P2-xxx-RP-G-0140-P01
Date	AUGUST 2018

# **VERSION CONTROL**

Version	Date	Author	Checker	Approver	Changes
Original Issue	August 2018	AW	AP/JL	GF	

This report dated 01 August 2018 has been prepared for Homes England (the "Client") in accordance with the terms and conditions of appointment dated 27 July 2018(the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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# **APPENDICES**

APPENDIX A Combined Exploratory Hole Location Plan

# **APPENDIX B**

**Soil Screening Values** 

# **APPENDIX C**

**Risk Assessment Definitions** 

# **1** Introduction

# 1.1 Terms of Reference

Arcadis Consulting (UK) Limited (Arcadis) was instructed by Homes England, 'the Client', to undertake a ground investigation at the proposed site, known as Parcel 2A within the Northstowe development near, Cambridge. This information will supplement existing data held for this land area.

The investigation has been integrated with existent data, to provide improved ground condition information to potential developers.

It should be noted that it is proposed to increase site levels across the north of the Parcel 2A site by approximately 0.5m, as part of the water management scheme. Therefore near surface soil conditions, are likely to change from those recorded by some exploratory holes and as reported herein. The quality of the imported fills will therefore define near surface land quality in those areas that are filled. Full details of fill areas are not yet known.

A review of the existing ground information data was undertaken to inform design of the supplementary investigation.

The previous investigations completed for the wider Phase 2 development was based generally on a 50m grid spacing. It was proposed to fill in the gaps in the 50m grid with appropriate testing (boreholes, trial pits, soakaways etc).

In the previous investigation / assessment (Ref 4), one contamination hotspot was identified at TPB022 (0.4m). This area was to be investigated further to interrogate the potential risk to future development works and the wider environment.

Details of the most recent (supplementary) investigation are provided within the factual report (Ref 5).

## 1.2 Proposed Development

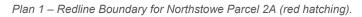
At the time of writing no fixed development plans are available for the Parcel 2A site. It is therefore assumed that the development will be of mixed use with low rise residential dwellings along with high rise mixed use structures either side of the guided busway.

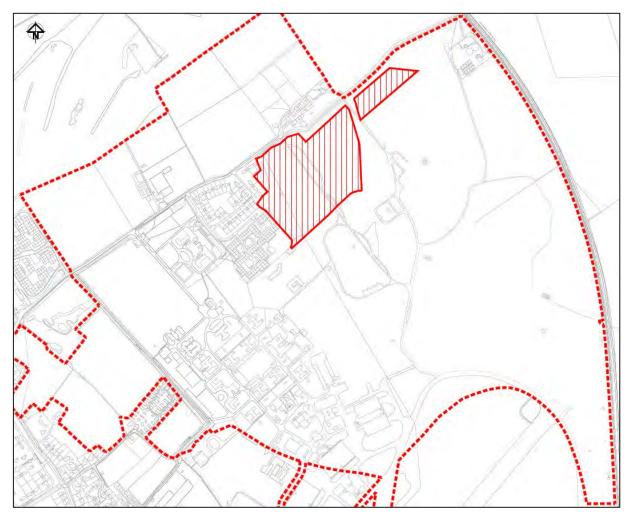
The wider Phase 2 Northstowe development scheme comprises the following;

- Development of the main Phase 2 development area into approximately 3,500 dwellings, schools, town centre including employment uses, formal and informal recreation space and landscaped areas, the eastern sports hub, the busway, a primary road to the southern access, construction haul route and engineering and infrastructure works, and
- Construction of a highway link (Southern Access Road (West) (SARW)) between the proposed new town of Northstowe and the B1050, improvements to the B1050 and associated landscaping and drainage.

Levels will be raised by approximately 0.5m across the north of the Parcel 2A site.

Plan 1, below, shows the proposed Parcel 2A area within the main Phase 2 development area.





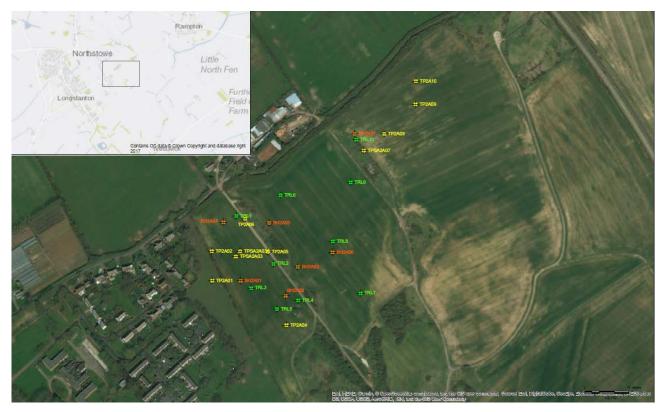
# **1.3 Supplementary Reporting**

The assessment and recommendations made in this report are based upon the following documents which should be referred to for factual data:

- Arcadis, Northstowe Phase 2A Factual Ground Investigation Report, July 2018 (Ref 5).
- Arcadis, Northstowe Phase 2 Factual Ground Investigation Report, 2017 (Ref 2).
- WSP Environmental (UK) (2007) Northstowe Zone B Interim Factual Report (Ref 14)

The following is an excerpt (Plan 2 – Parcel 2A Exploratory Hole Location Plan) from the Factual Report which details the exploratory hole location plan for the 2018 intrusive investigation at the Parcel 2A site.

A combined exploratory hole location plan is presented within Appendix A.



#### Plan 2 – Parcel 2A Exploratory Hole Location Plan (2018 Supplementary)

## 1.4 Limitations

This report has been prepared for the client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format shall remain the property of Arcadis.

This report has been compiled from a number of sources, which Arcadis believes to be trustworthy. However, Arcadis is unable to guarantee the accuracy of information provided by others. The report is based on information available at the time. Consequently, there is a potential for further information to become available, which may change this report's conclusion and for which Arcadis cannot be responsible.

It should be noted that ground conditions between exploratory holes may vary from those identified during and ground investigations; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigations were carried out and the weather before and during the investigations, (carried out at different times).

# **1.5 Northstowe Phase 2 Background Information**

The Northstowe development is centred on the former RAF Oakington Airfield and surrounding farm land. Previous specialist work, for example, ground investigations (undertaken between 2005-2007) and UXO surveys have been undertaken by others across the area which includes the Phase 2 development. The Phase 1 development, which is to the north of this site, is currently being developed by Gallaghers.

# 2 Site Setting

# 2.1 Site Location and Description

The investigated site is situated approximately 10 km northwest of Cambridge and east of the village of Longstanton and north of the village of Oakington, within South Cambridgeshire District Council; at an approximate National Grid Reference (NGR) TL404668.

The Parcel 2A development area is approximately 8.5 hectares and is generally flat, with levels falling slightly to the north and east.

# 2.2 Site History

The Parcel 2A development area 'the site' includes open space and limited hardstanding associated with the former RAF Oakington Airfield and former barracks, farmlands and a section of Rampton Road.

The area off-site and to the west of the site boundary was the location of the main barrack buildings including the former living quarters and associated welfare / training facilities / offices / vehicle maintenance garages and fuel storage areas.

# 2.3 Published Geology, Hydrogeology, Hydrology and Relevant Environmental Information

Below is a summary of site information to assist with providing context to the report. Further baseline information can be found in the Phase 2 Geo Environmental Assessment and Outline Remedial Strategy Report (Ref 4).

	Superficial Deposit: River Terrace Deposits comprised of clay, sand and gravel.
	The superficial deposits (River Terrace Deposits) on the site are classified as a Secondary A aquifer by the Environment Agency (EA). Secondary A aquifers are defined as "permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers".
	Their mode or occurrence is naturally variable, and is not persistent across all areas. Where present there is a strong influence on local groundwater conditions.
Geology / Aquifer Status	<b>Solid Geology:</b> Based on Geological Mapping at 1:50,000 scale, Sheet 187 (drift) Huntingdon and Sheet 188 (solid and drift) Cambridge, the geological sequence underlying the locality is River Terrace Deposits over Kimmeridge Clay and Amptill Clay.
	The bedrock (Kimmeridge Clay Formation and Ampthill Clay Formation) is classified as Unproductive Strata. Unproductive Strata is defined as "rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow"
	Parcel 2A is mapped as underlain by Kimmeridge Clay and the Amphill Clay.
	There are no geological faults located on the site, according to the BGS mapping.
Additional Geological Information	The previous borehole/investigations, undertaken by the British Geological Survey between 1980's and 1990's across the whole Northstowe Phase 2 area, encountered between 0.2 m and 1.2 m of medium dense made ground overlying medium dense to dense River Terrace Sand and Gravel between 4 m and 6 m thick before proving the bedrock.
Radon	The radon risk has been assessed and indicates that the site is not in a radon affected area, as less than 1% of properties are above the action level, therefore no protective measures are necessary.

Within a Source Protection Zone	The site is not situated within a Source Protection Zone (SPZ).	
Licensed Groundwater Abstraction Points	There are a number of groundwater abstractions within 2000m of the site, with groundwater being utilised by multiple sources for spray irrigation and agriculture purposes.	
Surface Water Feature	Vater Feature A number of field drains within the surrounding agricultural land, and the Beck Brook some 800 east of the site, which flows in a northerly direction.	
Likely Groundwater Flow Direction	Groundwater flow is likely to be to the north and northeast and it is considered likely that groundwater is in continuity with Beck Brook to the east of the site. Groundwater is often found to be close to the surface.	

# **3** Conceptual Site Model- Pollutant Linkages

# 3.1 Introduction

The following sections detail the potential receptors, pathways, and contaminants that may be present at the site based on the historical use and information provided in the desk study. The definitions of a "receptor", a "pathway" and a "contaminant source" are provided in the box below.

A pollutant linkage is a term used to describe a particular combination of contaminant-pathway-receptor. A pollutant linkage exists where a pathway links an identified receptor to an identified contaminant source. This is the basis for contaminated land assessment.

A receptor may be defined as either:

- (a) a living organism, a group of organisms, an ecological system or a piece of property which is being, or could be, harmed, by a contaminant; or
- (b) controlled waters which are being, or could be polluted by a contaminant.

A pathway may be defined as

A route, or routes, by which a receptor:

- (a) is being exposed to, or affected by a contaminant, or
- (b) could be so exposed or affected.

A pathway can only be identified if it can expose an identified receptor to an identified contaminant.

A contaminant source may be defined as

a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters and/or pose a risk to human health.

The relationship between the above three elements is called a 'pollutant linkage'. All three elements must be present for a pollutant linkage to exist.

# 3.2 Potential Receptors

The potential receptors detailed below take into consideration the proposed development of the site into residential housing, some of which will have private gardens.

#### **Human Health**

• Site Users (residents, visitors, maintenance workers and contractors).

Contamination risks to construction workers are not appraised by chronic (long term) exposure human health risk assessments. There are no appropriate published criteria applicable to assessment of potential risks to construction workers. The potential risks should be addressed by a site-specific construction workers risk assessment and implementation of appropriate health and safety measures, to adequately mitigate any potential risks.

All works should be conducted in accordance with the CDM Regulations 2015 (Ref. 11) or any other relevant guidance. Constructions workers are not considered further in this assessment.

#### **Controlled Waters**

- Groundwater Secondary A aquifer
- Surface water features (Beck Brook to the east of the site, and a number of field drains within the surrounding land)

•

#### Buildings

- Underground structures / services (water pipes, concrete, foundations)
- Proposed buildings.

## 3.3 Potential Pathways

Potential pathways are the routes that link the receptor to the contamination. The potential pathways for this site are summarised in the table below.

Table 3.1: Potential Contaminant Pathways

Receptor	Description	
Human Health (residents, visitors and maintenance workers)	Accidental ingestion of contaminants within soil, water and dust Inhalation of dust, vapours and ground gases Dermal contact with contaminants within soil, water and dust Vegetable uptake within private gardens	
Controlled Waters (Secondary A aquifer / Beck Brook)	Leaching of potential contaminants in soil or Made Ground into groundwater Vertical migration of soluble contaminants through the unsaturated zone into groundwater beneath the site Surface run-off and lateral migration	
Buildings	Direct contact of building services or foundations with contaminants in the soil and Made Ground Gas and / or vapour accumulation in confined and poorly ventilated spaces	

# 3.4 Potential Contaminant Sources

Based on the information obtained from the existing data and information obtained from historical and environmental research and the site information, there are a number of potential contaminative sources identified on and off-site. These are summarised in Table 3.2 below.

It should be noted that it is considered unlikely that all the potential contaminants would be present at significant concentrations within the site.

Table 3.2: Potential Sources of Contamination

Source	Potential Contaminants
Onsite	
Made Ground/ reworked ground/ imported ground associated with current use and historical use as the RAF Oakington	Metals, polyaromatic hydrocarbons (PAHs), Fuel Spillages - petroleum hydrocarbons (TPHs), asbestos, ground gases and vapours, UXO.
Offsite	
RAF Oakington and former Barracks	Metals, PAHs, TPHs, asbestos, ground gases and vapours, UXO
Sewage Treatments Works	Metals, PAHs, TPHs, asbestos, ground gas and vapours.
Infilled areas (pits / ponds)	Ground gases

# 4 Intrusive Ground Investigation

## 4.1 Scope of Works

The ground investigation was designed and undertaken to establish the geo-environmental and geotechnical status of the site and provide evidence of its suitability for the proposed land use.

Full details of the scope of works and an exploratory hole location plans are included in the Arcadis Factual reports (Ref 2 & 5).

# 4.2 Ground Conditions & Geotechnical Testing

Full details of the ground conditions encountered are included in the exploratory hole logs presented in the factual reports and are summarised below.

#### Topsoil

In general, the Topsoil was encountered across the majority of the site between ground level (GL) and 0.45mbgl (in areas which had not been stripped during previous archaeological scrapes). The Topsoil appears to variable and is believed to be associated/sourced from the underlying geological units including the River Terrace Deposits, the Kimmeridge Clay and Made Ground deposits.

The Topsoil in general comprised grass over silty gravelly fine to medium Sand or slightly gravelly sandy (silty) Clay with roots and rootlets. Gravel is subangular and sub-rounded fine to medium of mixed lithologies including flint.

Geotechnical classification tests undertaken on six samples of cohesive Topsoil of depths ranging from GL to 0.25mbgl indicated the following;

Test	Values
Natural Moisture Content	11 20
Liquid Limit	42 – 72
Plastic Limit (%)	17 – 34
Plasticity Index (%)	19 – 47
Fraction Passing <0.425mm (%)	68 – 92
Modified Plasticity Index (%)	17 - 42.3

The classification test result indicates that the cohesive samples of Topsoil have a modified plasticity index of 17.3-42.3%, which therefore has a low to high shrink-swell potential.

Geotechnical classification tests undertaken on 2no samples of the Topsoil between GL and 0.20mbgl indicated that soils consist of slightly gravelly sandy Clay and gravelly very silty/clayey Sand.

1no dry density/moisture content relationship test was undertaken on a cohesive sample of the Topsoil, and indicated the following;

Table 4.2 Summary of the Dry Density / Moisture Content Relationship of the Topsoil

Test	Values
Initial Moisture Content	31%
Maximum Dry Density	1.71Mg/m <sup>3</sup>

Test	Values	
Optimum Moisture Content	15	
Particle density assumed at 2.65Mg/m <sup>3</sup> for all samples		

#### Made Ground

Made Ground was found in isolated areas across the Parcel 2A site area and was encountered to a maximum depth of 1.50mbgl within TP2A05 (however the extent was not proven as the trial pit was aborted due to a significant water strike). Made Ground at the site is typically re-worked natural deposits. Several descriptions have been given for the Made Ground, but it was generally cohesive and encountered as slightly sandy slightly gravelly Clay with varying amounts of brick, concrete, flint, charcoal and coal.

The Made Ground deposits encountered within TP2A05 were granular and comprised of slightly silty very gravelly Sand, with gravel comprised of brick and concrete and flint.

Made Ground was typically found with a quantity of oversize materials including cobbles of brick and concrete. No visual or olfactory evidence of contamination was observed during the intrusive investigation.

Geotechnical classification tests undertaken on three samples of cohesive Made Ground at a depth of between GL and 0.50mbgl indicated the following;

Table 4.3 Summary of Cohesive Made Ground Classification

Test	Values
Natural Moisture Content	12 – 30
Liquid Limit	30 – 73
Plastic Limit (%)	19 – 26
Plasticity Index (%)	11 – 51
Fraction Passing <0.425mm (%)	47 – 100
Modified Plasticity Index (%)	5.2 – 44

The classification test results indicate that cohesive samples of Made Ground have a modified plasticity index ranging from 5.2% to 44%, which therefore has a low to high shrink-swell potential.

Geotechnical classification tests undertaken on 1no sample of Granular Made Ground between depths 0.60m and 0.80mbgl indicated that soils consisted of slightly sandy Silt/Clay at that particular depth, which highlights the variability of the Made Ground deposits.

Laboratory remoulded California Bearing Ratio (CBR) tests were undertaken on 2no samples of granular Made Ground at a depth of between 0.15m to 0.70mbgl which recorded a CBR value ranging from 7.1% to 31.1%.

Due to the shallow depth of Made Ground deposits at the subject site no representative SPT tests were undertaken within the stratum.

#### **River Terrace Deposits (RTDs)**

The RTDs mainly consists of alternative layers of clays (cohesive) and sands and gravels (granular) across the Parcel 2A site area, to a maximum depth of 3.70mbgl. RTD's were not recorded within exploratory holes to the northeast of the investigation area. The greatest depth of the RTD's was located within BH613 within the northeast of the investigation area, and within BH1002 in the very south of the investigation area.

Cohesive RTDs typically were comprised of slightly gravelly sandy Clay, sandy gravelly Clay and slightly gravelly slightly sandy silty Clay.

Geotechnical classification tests undertaken on six samples of cohesive RTDs at a depth of between GL and 1.00mbgl indicated the following;

Test	Values
Natural Moisture Content	17 – 43
Liquid Limit	41 – 66
Plastic Limit (%)	16 – 32
Plasticity Index (%)	15 – 42
Fraction Passing <0.425mm (%)	76 – 94
Modified Plasticity Index (%)	12.9 – 37.4

Table 4.4 Summary of Cohesive River Terrace Deposits Classification

The classification test results indicate that cohesive samples of the River Terrace Deposits have a modified plasticity index ranging from 12.9% to 37.4%, which therefore has a low to high shrink-swell potential.

Geotechnical classification tests undertaken on 9no samples of Granular RTDs between GL and 3.00mbgl indicated that soils consisted of silty/clayey Sand and Gravel, very silty/clayey very gravelly Sand, silty/clayey very gravelly Sand and very silty/clayey gravelly Sand. Gravel primarily consists of flint.

These deposits are, by the nature of deposition, likely to be highly heterogeneous, and variation in lithology should be anticipated both laterally and with depth beyond the locations of each exploratory hole. This natural variation will strongly influence permeability and entry of water into excavations, and stability of excavations, in the presence of groundwater.

Laboratory remoulded CBR tests were undertaken on 5no samples of both cohesive and granular RTDs at GL to 1.20mbgl recorded a CBR value ranging from 0.7% to 7.6%.

Hand vane testing undertaken within cohesive RTDs ranged between 59 to 120kPa. The higher values are likely to be skewed (e.g. by presence of gravel) and not representative of undrained shear strength.

SPT testing undertaken within the RTDs ranged between N-values of 4 to 32 indicating loose to medium relative densities and very soft to apparent stiff consistencies. The higher values are likely to be skewed (e.g. by presence of gravel) and not representative of undrained shear strength.

#### Kimmeridge Clay Formation

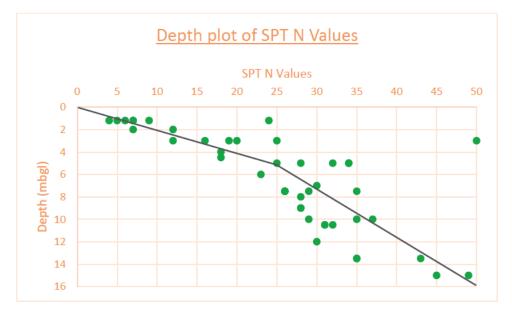
The Kimmeridge Clay was encountered below the River Terrace deposits across the site. The Kimmeridge Clay in places within 2A is encountered at a shallow depth from 0.50mbgl.

The Kimmeridge Clay typically comprises a firm to stiff dark grey silty Clay with bands of weathered grey siltstone approx. 0.2 m thick. Selenite crystals (<5mm), gypsum crystals, flint, siltstone, shells and pockets of sand and silt were encountered at depth. Shallower and more weathered deposits were encountered with orange mottling.

The base of the Kimmeridge Clay was not proven during the multiple phases of investigation.

Hand vane testing undertaken within cohesive Kimmeridge Clay recorded between 70 to 140kPa.

SPT testing undertaken within the Kimmeridge Clay recorded SPT N-values of between 5 to 50 indicating firm to very stiff consistencies. In general an overall increase in strength with depth was noted within the data set. Figure 4.1 below displays the relationship between depth and the increase in SPT N-value.



Geotechnical classification tests undertaken on 64 samples of the cohesive Kimmeridge Clay Formation at a depth of between 0.50m and 15.45mbgl indicated the following;

Table 4.5 Summary of Cohesive Kimmeridge Clay Classification

Test	Range of ∀alues
Natural Moisture Content	8.2 – 87
Liquid Limit	43 – 83
Plastic Limit (%)	16 – 37
Plasticity Index (%)	22 – 55
Fraction Passing <0.425mm (%)	75 – 100
Modified Plasticity Index (%)	17.2 – 55

The classification test results indicate that these cohesive samples of the Kimmeridge Clay Formation have a modified plasticity index of 17.2 to 55%, which therefore has a low to high shrink-swell potential.

Geotechnical classification testing on 1 cohesive sample of the Kimmeridge Clay indicated that the soils consist of slightly gravelly slightly sandy silty Clay.

Laboratory remoulded CBR tests were undertaken on 4no samples of the cohesive Kimmeridge Clay at a depth of between 0.20m to 0.80mbgl and recorded a CBR value ranging of 0.1% to 6.4%. It is possible that the sample which recorded a CBR value of 0.1% is either a reporting error or the result has been heavily influenced by sample disturbance or excess moisture.

11no dry density/moisture content relationship tests were undertaken on cohesive samples of the Kimmeridge Clay across the site, and indicated the following;

Table 4.6 Summary of the Dry Density / Moisture Content Relationship of the Kimmeridge Clay

Test	Range of ∨alues
Initial Moisture Content	21 – 44%
Maximum Dry Density	1.54 – 1.75Mg/m <sup>3</sup>
Optimum Moisture Content	13 – 22%

Particle density assumed at between 2.2-2.65 Mg/m<sup>3</sup> for tested samples

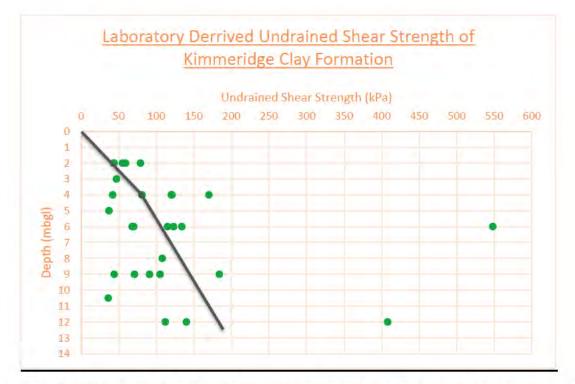
28no "undisturbed" samples were submitted for single-stage unconsolidated-undrained triaxial tests to determine the undrained shear strength (cohesion) of the material. A summary of the results is presented in the following table:

Table 4.7 Summary of Undrained Triaxial Shear Strength

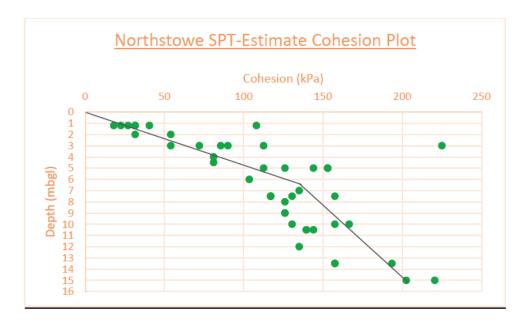
Exploratory Hole	Depth	Cell Pressure (kPa)	Undrained Shear Strength (kPa)	Mode of Failure
	2.00-2.45	40	43	Plastic
BH2A01	4.00-4.45	60	121	Compound
BHZAUT	6.00-6.45	80	70	Compound
	9.00-9.45	100	91	Compound
	4.00-4.45	50	81	Compound
BH2A02	6.00-6.45	60	115	Compound
BHZAUZ	9.00-9.45	90	184	Compound
	12.00-12.45	120	408	Compound
	3.00-3.45	60	47	Plastic
BH2A03	5.00-5.45	90	37	Plastic
	10.50-10.95	140	36	Plastic
	2.00-2.45	40	44	Compound
	4.00-4.45	80	42	Compound
BH2A04	6.00-6.45	110	548	Compound
	9.00-9.45	170	44	Compound
	12.00-12.45	230	140	Compound
	2.00-2.45	30	59	Compound
	4.00-4.45	40	120	Compound
BH2A05	6.00-6.45	60	123	Plastic
	9.00-9.45	90	105	Compound
	12.00-12.45	110	112	Compound
	2.00-2.45	40	55	Compound
BH2A06	6.00-6.45	100	68	Compound
	9.00-9.45	120	71	Compound

Exploratory Hole	Depth	Cell Pressure (kPa)	Undrained Shear Strength (kPa)	Mode of Failure
	2.00-2.45	40	79	Plastic
DU0A07	4.0046.45	80	170	Compound
BH2A07	6.00-6.45	110	134	Compound
	8.00-8.45	150	108	Compound

The results generally correspond to descriptions of firm to stiff clay soils, with an overall increase in strength with depth which is recorded within the depth plot on Figure 4.2 below. A number of the sample are likely to have been somewhat disturbed during sampling producing slightly lower shear strengths than what would usually be expected from the SPT N-values.



The cohesion/shear strength of the strata has also been estimated based on the relationship between shear strength (c), plasticity index and SPT N value (after Stroud, 1975) whereby c = f1 N. A mean plasticity index of 43% (obtained from onsite testing) has been used to determine coefficient f1 = 4.5. The depth plot is presented in Figure 4.3 below.



1no "undisturbed" samples were submitted for multi-stage unconsolidated-undrained triaxial tests to determine the undrained shear strength (cohesion) of the material. A summary of the results is presented in the following table:

Table 4.8 Summary of Undrained Triaxial Classification - multistage

Exploratory Hole	Depth	Cell Pressure (kPa)	Undrained Shear Strength (kPa)	Mode of Failure
	6.00 - 6.45	60	76	Compound
BH613		120	89	
		240	95	_

The result corresponds to description of stiff clay soil.

#### Groundwater

Groundwater strikes were noted at depths of between 0.80mbgl and 14.60mbgl within Made Ground, River Terrace Deposits and the Kimmeridge Clay Formation. A number of strikes coincided with the top of the Kimmeridge Clay Formation, and are an indication of "semi-perched" water condition atop of the predominantly cohesive bedrock unit (lower relative permeability). Rest water levels were recorded in the standpipes at depths of between 0.52 and 1.35mbgl. The strata are thus in hydraulic continuity.

It should be appreciated that ground and groundwater conditions may vary between and away from the exploratory hole positions, and that no account can be taken in this report of such variations.

It should also be noted that groundwater levels may be affected by seasonal variations such as rainfall and that no account can be taken of such variations in this report due to the short monitoring period.

Details of groundwater strikes are presented on the exploratory hole logs and within the groundwater monitoring data in the factual reports.

#### 4.3 Obstructions

No significant obstructions which would be prohibitive of development were encountered during the intrusive investigation.

# 4.4 Soak Away Testing

Soak Away tests were completed at the subject site. The soil infiltration rate was determined by conducting a soakaway tests in accordance with the methodology described in BRE 365. The tests were conducted in trial pits dug to the anticipated soakaway depth. Summary information of the tests and detailed test sheets are presented with the Factual Reports (Ref 2 & 5). The results of the testing are detailed below.

Tuble 4.5 Out	innary or soa	ak Away Testing	9		
Location ID	Depth of pit (m)	Time to empty (minutes)	Soil Infiltration Rate (f ms <sup>-</sup> <sup>1</sup> )	Strata	Comment/limitations
TPSA2A0 3A					
Test 1	1.3	41.5	2.55E-06	River Terrace	N/A
Test 2	1.3	52	2.31E-06	Deposits	
Test 3	1.2	60	1.69E-06		
TPSA2A0 7	2.1	-	No valid data	Kimmeridge Clay	Test pit filled only once due to excessive time to achieve infiltration.
TPSA610	1.7	-	6.02E-15	Kimmeridge Clay	Test pit filled only once due to excessive time to achieve infiltration.
TPSA905	2.0	-	No valid data	Kimmeridge Clay	Test terminated due to time constraints
TPSA911	1.10	-	1.36E-09	Kimmeridge Clay	Test terminated due to time constraints
TPSA914	1.30	-	No valid data	Kimmeridge Clay	Test terminated due to time constraints
TPSA922	1.10	-	2.13E-09	Kimmeridge Clay	Test pit filled only once due to excessive time to achieve infiltration.
TPSA100 2				D	
Test 1	1.30	-	1.06E-05	River Terrace Deposits	Test pit filled only twice due to excessive time to achieve infiltration.
Test 2	1.30	-	6.70E-06		

Table 4.9 Summary of Soak Away Testing

The tests completed within Parcel 2A display a marked difference in the permeability of shallow soils and potential for Sustainable Drainage Systems (SUDS) at the subject site. TPSA2A03A and TPSA1002 were undertaken within granular River Terrace Deposits positively drained and recorded a soil infiltration rate indicative of a good level of drainage.

The remainder were completed within areas where the Kimmeridge Clay is present at a shallow depth, and as such recorded very limited drainage and thus the tests were subsequently aborted.

It is unlikely that within areas where the Kimmeridge Clay is present at shallow depths of less than 2m, SUDS would not be feasible.

# 4.5 TRL Probe Testing

Ten DCP (Dynamic Cone Penetrometer) TRL (Transport Research Laboratory) probes were advanced across the site area, and in general recorded CBR values ranging from 0.43% to 145.15%, and a marked increase in CBR value with depth was recorded.

A number of anomalous high CBR values were recorded, and these are considered representative of the probe encountered and passing through coarse gravel or cobbles. They are not representative of CBR.

The results have been assessed in terms of the CBR-value using the relationship given as:

 $Log (CBR) = 2.48 - 1.057. Log (\frac{mm}{blow}).$ 

Full details of the DCP TRL testing and CBR results can be found within the Factual Report (Ref 5).

## 4.6 Visual or olfactory evidence of contamination

No tangible visual or olfactory evidence of contamination was observed during either phase of the intrusive investigation across the Parcel 2A site.

# **5** Geo-Environmental Assessment

# 5.1 Risk to Human Health – Soil

## 5.1.1 Data

Thirty environmental soil samples were analysed across the site during the most recent phase of investigation (Ref 5). However, this assessment utilises data obtained from the previous WSP (Ref 14) and Arcadis Investigation (Ref 2).

The samples were selected to approximate to a random stratified sampling pattern, to be representative the overall ground quality present at the site. During the WSP investigation elevated contaminants were noted within TPB022, as such TP2A06 was located to target this area.

These samples were analysed for a range of contaminants to determine the potential risk to site end users. The laboratory results are included in the Factual Reports (Ref 2, 5 & 14).

#### 5.1.2 Soil Screening Values (SSV)

The proposed end use of the site may include some mixed use, with the majority anticipated to be residential development. In advance of development specifics, for the purpose of this assessment, all soil samples have been conservatively screened against criteria protective of residential development with gardens/soft landscaping. As such an end use of residential with plant uptake has been used for screening purposes. All the soil chemical data has been screened against the current LQM/CIEH Suitable for Use Levels (S4ULs)<sup>1</sup> (Ref. 6) for Human Health Risk Assessment for a residential with plant uptake scenario. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been adopted (Ref. 7).

For organic contaminants SSVs corresponding to a 1 % Soil Organic Matter (SOM) have been used as Tier 1 screening values. This is considered to be a precautionary approach.

#### 5.1.3 Soil Results

#### Inorganics

The inorganic contaminant results for all the soil samples taken have been compared to appropriate SSV criteria, (see Appendix B). The majority of determinants were recorded below the SSV criteria.

A single exceedance of Lead above the SSV criteria was recorded within a single location in TP2A06 (0.00m-0.30m) with a concentration of 840mg/kg with respect to a SSV value of 200mg/kg. This sample was obtained from cohesive Made Ground.

No other inorganic contaminant concentrations exceed the SSV criteria.

The pH of the soil samples taken ranged from 7.1 (BH2A06 0.00-0.20m) to 7.9 (BH2A03 1.50-2.00m), indicative of near neutral soil.

#### Organics

Samples were analysed for Polycyclic Aromatic Hydrocarbons (PAH) compounds and Total Petroleum Hydrocarbons (TPH) fractions. The results were compared to SSV criteria as detailed above.

Elevated levels of PAHs were identified within two samples, TP2A06 (0.00m-0.30m) and TPB022 (0.40m). The TPB022 sample is from slightly gravelly Clay (River Terrace Deposits) however Made Ground was encountered above this strata to a depth of 0.35m which contained brick and concrete.

TP2A06 recorded exceedances of various PAH species including Phenanthrene with a concentration of 190 mg/kg with respect to a SSV of 95mg/kg, benzo(a)anthracene with a concentration of 110mg/kg with respect to a SSV of 7.2mg/kg, Chrysene with a concentration of 95mg/kg with respect to a SSV of 15mg/kg, benzo(b)fluoranthene with a concentration of 110mg/kg with respect to a SSV of 2.6mg/kg, benzo(a)pyrene with a concentration of 95mg/kg, Ideno(123cd)pyrene with a concentration of 45mg/kg with respect to a SSV of 27mg/kg, Dibenz(ah)anthracene with a concentration of 12mg/kg with

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respect to a SSV of 0.24mg/kg, and Benzo(ghi)perylene with a concentration of 46mg/kg with respect to a SSV of 32mg/kg.

Elevated levels of TPH were identified in a single sample of cohesive Made Ground, TP2A06 (0.00m-0.30m) with exceedances of the hydrocarbon fraction Aromatic C12-C16 with a concentration of 230mg/kg with respect to an SSV of 140mg/kg and Aromatic C16-C21 with a concentration of 1200mg/kg with respect to an SSV of 260mg/kg.

The shallow sample from TPB022 has elevated concentrations of five PAH compounds including Benzo(b)fluoranthene, Chrysene, Benzo(a) anthracene, Benzo(a)pyrene and Dibenz(ah)anthracene.

No other organic contaminant concentrations exceed the SSV criteria.

#### Asbestos

Samples were submitted for asbestos identification analysis. Loose Chrysotile Asbestos fibres were detected within a single sample of cohesive Made Ground, TP2A06 (0.00-0.30m). Asbestos was not identified at any of the other locations.

The positive asbestos detection within TP2A06 (0.00-0.30m) was quantified and recorded fibre content of 0.003%.

# 5.2 Risk to Controlled Water

#### 5.2.1 Data

Eighteen groundwater samples were taken from the installations across the site during the 2018 investigation and analysed for a suite of contaminants. This assessment has also utilised groundwater samples obtained from both the previous WSP and Arcadis investigations.

#### 5.2.2 Water Quality Standards (WQS)

To assess the groundwater in terms of its potential as a source of contamination to Controlled Waters, the contaminant concentrations have been compared against appropriate Water Quality Standards (WQS). The site is located on an unproductive aquifer however there is a Secondary A aquifer below.

There is a surface water feature located to the east of the site. For completeness the results have been compared to both UK Drinking Water Standards (UK DWS) (Ref 10) and Environmental Quality Standards for freshwater (EQS).

The EQS values have been taken from the Water Framework Directive (WFD) (Ref 11) which provides stringent screening values to be protective to the water environment.

When considering EQS values, for a number of contaminants, the hardness of the receiving water must be considered to determine the EQS. To be conservative the most stringent concentrations have been used.

For some of the metals, the EQS guideline for copper, zinc, lead and nickel are based on bioavailability. PNECs (Predicted No Effect Concentration) are calculated based on assumed Ca2+ and Dissolved Oxygen Concentrations.

#### 5.2.3 Groundwater Results

#### Inorganics

The groundwater samples were compared to the relevant WQS. Minor exceedances of the WQS were recorded within samples obtained from WS901, BH1002, BH613, BH2A02 and BH2A05. The samples recorded minor exceedances of Selenium, ranging from 16ug/l to 46ug/l with respect to EQS/DWS threshold of 10ug/l.

This is likely in part to be due to the stringent WQS. It is likely that the elevated concentrations of Selenium are representative of background conditions, and do not indicate a soil source of Selenium, or gross groundwater contamination at the site.

All other concentrations are below the relevant criteria, and no exceedances were recorded.

#### Hydrocarbons

The groundwater samples were analysed for Metals, Polycyclic Aromatic Hydrocarbons (PAH) compounds and Total Petroleum Hydrocarbons (TPH) fractions.

All concentrations recorded were below the level of detection.

#### 5.2.4 Leachate Results

Limited soil leachate analysis was undertaken to establish the risk from potential contaminants within the unsaturated zones and potential for impact to occur to Controlled Waters.

A single sample obtained from TP604 recorded elevated Chromium with a concentration of 6.9ug/l with respect to an EQS threshold of 4.7ug/l.

However, the single concentration exceedance above the WQS was recorded from leachate from a natural sample (2.00-2.20m). This is likely to be due to the presence of background concentrations and the stringent WQS being used as a comparison. It should be noted that the leachate analysis is a test within the laboratory and is undertaken to simulate what may occur on site.

## 5.3 Risk to Human Health – Ground Gas

#### 5.3.1 Introduction

To establish the ground gas regime for the site, the installations were monitored on three occasions between 29<sup>th</sup> June 2018 and 13<sup>th</sup> July 2018. There is considered to be no potential source of ground gases on site (e.g. no landfill sites or significant Made Ground) and therefore the monitoring has been undertaken to test/confirm this conceptual model of low risk.

The ground gas monitoring was undertaken using an infra-red gas analyser and flow pod. Concentrations of methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>) and oxygen (O<sub>2</sub>) in %, Hydrogen Sulphide (H<sub>2</sub>S) and Carbon Monoxide in ppm and ground gas flow in litres per hour (I/h) were recorded during each visit.

After the monitoring was undertaken, each well was dipped to record the groundwater level in each location.

#### 5.3.2 Gas Monitoring Results

Below is a summary of the range of ground gas monitoring results recorded from three gas monitoring visit completed at the site. Full details are provided in the factual report.

Range of Results (steady st	ate)		
	First (29/06/18)	Second (06/07/18)	Third (13/07/2018)
Methane (%v/v)	0.0	0.0 – 0.1	0.0
Carbon Dioxide (%v/v)	0.1 – 1.7	0.1 – 3.7	0.1 – 3.8
Oxygen (%v/v)	18.0 - 21.0	16.8 – 20.8	16.6 – 20.8
Carbon Monoxide (ppm)	0.0 - 4.0	0.0 - 4.0	0.0 – 9.0
Hydrogen Sulphide (ppm)	0.0 – 1.0	0.0	0.0 - 0.0
Ground Gas Flow (l/h) (steady)	0.1 – 3.0	0.1 – 1.2	0.1
Atmospheric Pressure	1025	1019 - 1021	1021 – 1023

Table 5.1 Summary of gas monitoring data

#### 5.3.3 Hazardous Ground Gas Assessment

A ground gas risk assessment has been undertaken to evaluate the risk posed to potential receptors of the proposed residential development.

CIRIA guidance (*Assessing risk posed by hazardous gases to buildings*, CIRIA C665) (Ref. 8) has been used to inform the ground gas assessment which adopts the method proposed by Wilson and Card (Situation A) and NHBC (Situation B). For residential housing Situation B is appropriate. For this approach, the ground gas concentration and borehole flow rate are used to calculate a Gas Screening Value and define a traffic light scenario (Situation B).

A Gas Screening Value (GSV) is calculated using the following equation:

GSV (I/h) = borehole flow rate (I/h) x ground gas concentration (v/v %)

Using the maximum concentrations and flow rate the following GSVs have been calculated. The maximum steady rate (0.1 where this is 0.0) recorded has been used as this is considered more representative.

The GSVs calculated are;

- Methane = 0.003l/hr (0.1% and 3.0l/h flow)
- Carbon Dioxide = 0.051l/hr (1.7% and 3.0l/h flow)

Based on the values calculated, the Methane and Carbon Dioxide GSVs are considered to be Characteristic Situation 1 (CS1).

Furthermore, no elevated concentrations of Methane were recorded at the site above the CS1/CS2 threshold. of 1.0%v/v.

No elevated concentrations of Carbon Dioxide were recorded at the site above the CS1/CS2 threshold of 5%v/v.

Therefore, the site is classified as Characteristic Situation 1 (Situation A) or Green (Situation B).

No elevated concentrations of Carbon Dioxide or Methane were recorded during monitoring visits detailed within the boreholes installed during the previous WSP (Ref 14) or Arcadis Investigations (Ref 2) within the Parcel 2A site. Previous data would confirm the classification as Characteristic Situation 1 (Situation 1) or Green (Situation B).

These results indicate a very low gas risk on site and this finding is consistent with the conceptual site model. Under CS1 ('very low' gas risk) no special gas protection measures would be required for the proposed structures.

# 5.4 Quantitative Risk Assessment

#### 5.4.1 Methodology

Geo-environmental assessments are required to consider the significant of potential contamination in terms of plausible contaminant source-pathway-receptor contaminant linkages. As part of this process, it is necessary to develop a conceptual model of these potential contaminant linkages by identifying the potential contamination sources, sensitive receptors and potential exposure pathways. A risk assessment is then undertaken to determine the likelihood and significance of these potential linkages.

Risk assessment involves identifying hazards and determining their potential severity and likelihood, if an impact occurs on identified receptors. Risks are generally managed by changing the receptor, isolating the sensitive receptor by intercepting or interrupting the exposure pathway, or removing the source. If no pollutant linkages are formed, there is no risk. The following risk assessment focuses on the potential contaminants identified on the site and the proposed development of the site.

CIRIA guidance C552 (Ref.9) states that the designation of risk is based upon a consideration of both:

- The likelihood of an event (probability); (takes into account both the presence of the hazard and the receptor and the integrity of the pathway).
- The severity of the potential consequence (takes into account both the potential severity of the hazard and the sensitivity of the receptor).

Under such a classification system the following categorisation of risk has been developed and the terminology adopted as follows (Table 6.1):

Table 5.2: Risk Cate	gorisation
Risk Term	Description
Very High Risk	There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action or there is evidence that significant harm to a designated receptor is already occurring.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that such harm would be relatively mild. Some remediation work may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely, at worst, that this harm if realised would normally be mild. Any subsequent remediation works are likely to be relatively limited.
Very Low Risk	It is a low possibility that harm could arise to a receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Further risk assessment information is included in Appendix C.

#### 5.4.2 Pollutant Linkages – Conceptual Site Model

As discussed above in Section 4.0, for a pollutant linkage to be present on the site, a source, pathway and receptor must all be present at the site. An updated Conceptual Site Model is presented below;

RCL No	Contaminant Source	Sensitive Receptor	Pathway	Hazard (Severity)	Likelihood	Potential Risk	Comments
RCL1	contaminants (lead), PAH Compounds including TPH in Made Ground and shallow Natural Soils in TP2A06 & TPB022	Human Health	Ingestion / Inhalation / Dermal Contact / Veg uptake	Chronic damage, carcinogenic compounds (Medium)	Low to Likely Contaminant concentrations have been found to be elevated in proposed residential areas, however the contamination is not widespread. In areas of proposed housing with private gardens, a large proportion of the site would be soft landscaping and therefore it is likely that receptors would come into contact with contaminants if present in the surface soils if no remediation / mitigation is undertaken.	Moderate / Low to Moderate	Contamination has been encountered in the near surface soils in specific sample locations across the site, however contamination is not found to be widespread. The level of remediation / mitigation required will depend on the final design of the development in the areas where elevated results have been encountered but either offsite removal or some basic cover protection is likely to be warranted, focused in soft landscaping areas.
RCL2		Controlled Waters (Groundwater and Surface water)	Leaching and migration into water environment	Reduction of water quality, although unlikely to be a potable resource. (Mild - Medium)	Likely. Exceedances of WQS have been recorded in the groundwater analysis undertaken. This indicates that contaminants are available if infiltration occurs.	Low to Moderate	Elevated contaminants concentrations have been encountered in the groundwater especially inorganic contaminants. The elevated concentrations may be associated with background levels and discussion with EA should be sought to understand if remediation is required.
RCL3		Buildings / Services	Contact of contaminants with buildings and	Damage to structures (Mild)	Low. Identified contaminants are unlikely to cause significant damage to new buildings, if appropriate concrete design is	Low	No pH concentrations outside the normal range of 6-9 units have been detected,

#### Table 5.3 Conceptual Site Model for a Residential land use at Parcel 2A

RCL No	Contaminant Source	Sensitive Receptor	Pathway	Hazard (Severity)	Likelihood	Potential Risk	Comments
			structures (excluding potable water supply pipes)		used. Contamination is not widespread across the site.		
RCL4	Asbestos TP2A06	Human Health	Inhalation of fibres	Chronic damage, carcinogenic compounds ( <b>Medium</b> )	Low to Likely. Asbestos fibres have been detected in one sample location (TP2A06) within the residential development area. These were encountered within the soil matrix. Inhalation of fibres could occur if disturbed causing a risk to site end users if left on site, Low likelihood relates to majority of sampling positions where no asbestos was encountered.	Moderate / Low to Moderate	Mitigation / remedial action / watching brief will be required prior to development to ensure that the risk from asbestos is mitigated. Probably via off site removal or basic cover system in areas of soft landscaping. It is noted that this is not a widespread issue across the site.
RCL5	Ground Gases (methane and carbon dioxide - on- site source)	Human Health	Inhalation in confined spaces	Asphyxiation (Severe)	Very Low. Low concentrations of methane and carbon dioxide were recorded in areas across the site. Based on the current information, the risk to residential end users is considered to be very low.	Very Low	Based on the recent ground gas monitoring data and using CIRIA guidance, no ground gas protection measures are likely to be required in proposed residential development. This gas regime recorded fits with
RCL6		Buildings (on-site)	Accumulation in confined spaces	Explosion (Severe)	Low. Low concentrations of methane and carbon dioxide were recorded in areas across the site. Based on the current information, the risk to the proposed buildings is considered to be very low.	Moderate	gas regime recorded fits with the conceptual site model and SI findings – i.e. that there is no significant Made Ground or other potential sources such as landfill sites.

RCL No	Contaminant Source	Sensitive Receptor	Pathway	Hazard (Severity)	Likelihood	Potential Risk	Comments
RCL7	Elevated inorganic contaminants	Controlled Waters (Groundwater and Surface water)	Leaching and migration into water environment (off-site)	Reduction of water quality ( <b>Medium</b> )	Likely. Contaminant concentrations (Selenium) have been detected in the groundwater. Groundwater flow is likely to be to the east towards Beck Brook and therefore there it is considered likely that the contamination may migrate and discharge into the Brook.	Low - Moderate	Due to the distances involved the risk to the Brook is deemed low and contaminant concentrations are likely to be representative of background conditions. However, discussions with the EA should be undertaken to determine their position. Monitoring of groundwater may be required during re-development to ensure that groundwater quality is not affected during site works

RCL = Residential Contaminant Linkages

### **Pollutant Linkages Discussion**

Concentrations above the appropriate SSVs for Lead, PAHs and TPH were identified within two samples (TP2A06 & TPB022) obtained during the intrusive investigation. Additionally, loose chrysotile asbestos fibres were identified in one sample (TP2A06).

The results are not indicative of gross site wide contamination. A "hotspot" area does exist within the footprint of the site and has been identified within the vicinity of TP2A06 & TPB022. The only exceedance recorded within Made Ground deposits was within TP2A06 (0.00-0.30m) and, a single exceedance of the natural deposits was recorded in TPB022 (although this samples was obtained directly underneath Made Ground).

The driving exposure pathways for the metals, PAH and TPH (greater than C12) comprise direct exposure pathways including soil ingestion/inhalation and dermal contact. Therefore, in areas with buildings/external hard-standing or similar, no such potential pollution linkage would exist, and hence no specific remedial measures would be required. However, in the areas of soft landscaping and private garden areas the potential contamination linkage will need to be broken, either by physical excavation of these materials, or by capping with a suitable thickness (likely to be 600mm) of uncontaminated cover soils. In general landscaping areas this thickness could likely be reduced. Clean cover soils in landscaped areas will also prevent new planting from being affected by phytotoxic conditions.

Once development plans are known, the extent of the hotspot can be proven and confirmed through laboratory analysis of soil samples. If it coincides with a sensitive use, such as gardens, the impacted soils could be removed and disposed of to an appropriate waste treatment facility (likely to be hazardous waste due to TPH greater than 1000mg/kg). Once removed offsite, the soils left in-situ would be validated to confirm their suitability to remain onsite. If suitable, no further remedial measures would be required for the proposed development, as the source-pathway-receptor linkage would be broken.

The primary exposure pathway for asbestos fibres is inhalation/ingestion. The asbestos detection within TP2A06 was quantified and recorded a fibre concentration of 0.003% which is marginally above the level of detection of 0.001%, however there is a credible risk both during the construction phase and to potential end users of the site. The asbestos hotspot should be delineated. If it coincides with permanent hardcover, then if regulators agree, it could probably be left in-situ and managed through an asbestos management plan detailed within the remediation statement, or if it coincides with gardens, for example, excavated and removed offsite to an appropriate waste disposal facility.

Gas concentrations and flow rates recorded at the subject site indicate that the site is classified as Characteristic Situation 1, as such no special protection measures are likely to be required within the proposed structures.

Minor Selenium exceedances of the WQS have been recorded within the groundwater samples, however these are minor and most probably representative of background concentrations. Therefore, the risk to Controlled Water is deemed low.

In order to satisfy and enable the discharge of the likely future relevant Planning Conditions (including precommencement conditions), it is recommended that the findings of this report (with respect to contamination) be formalised in a development-specific Remediation Statement (detailing the development scheme and most appropriate remedial option) and be submitted to the Local Planning Authority for their approval.

# **6** Geotechnical Assessment

Details of in-situ testing (SPTs) undertaken during the investigation works and the geotechnical test results are included within the Factual Reports (Ref 2, 5 & 14). Below is a preliminary assessment to provide details of the elements that will need consideration during the design of the development.

# 6.1 Groundwater

Typically groundwater was not encountered within the upper few meters of strata penetrated, during the very short period exploratory holes were open during site work. However, groundwater levels are generally high, and the absence of immediate entry is more likely a function of the lower permeability of clay materials and the smearing effect of forming exploratory holes.

Groundwater strikes were noted at depths of between 0.80mbgl and 14.60mbgl while rest water levels within monitoring wells were recorded in the standpipes at depths of between 0.52 and 1.35mbgl.

Excavations at the site should be feasible using an appropriate scale of hydraulic plant. All excavations at the site will require adequate lateral support, or battering back to a safe angle, to ensure their stability.

Based on the available data, it is considered likely that perched groundwater will be encountered in shallow excavations (i.e. <2.0mbgl) at the site, especially during periods of wet weather and in this scenario appropriate groundwater control/dewatering provisions should be employed to keep such excavations dry.

# 6.2 Soakaway Performance

BRE365 Soak Away tests were attempted across the 2A Parcel within ground conditions representative of River Terrace Deposits and the Kimmeridge Clay respectively. This is deemed representative of the wider site conditions, considering the ground conditions which were encountered during the intrusive works.

The result of the infiltration test within the River Terrace Deposits is indicative of a moderate to good soakage potential. However, high groundwater conditions may prevent the application of standard designs, as there will be little or no unsaturated zone beneath soakaways. Early consultation with the Environment Agency would be prudent.

The result of the infiltration tests undertaken within the Kimmeridge Clay is indicative of poor soakage and a corresponding low permeability and it is likely that an infiltration drainage solution will not be suitable at the site within areas where the Kimmeridge Clay is encountered at a shallow depth.

This should be confirmed through the use of 'full scale' BRE 365 soak away testing once specific development proposals are available for the site.

## 6.3 Road Pavements

It is likely that the pavement subgrade exposed at formation levels will comprise the both granular and cohesive River Terrace Deposits, variable Made Ground or cohesive strata of the Kimmeridge Clay Formation. In filled areas, the imported fill may be the formation material.

Laboratory remoulded CBR tests were undertaken on granular Made Ground and recorded a CBR value ranging from 7.1% to 31.1%. Laboratory remoulded CBR tests were undertaken on cohesive and granular RTDs recorded a CBR value ranging from 0.7% to 7.6%. While Laboratory remoulded CBR tests were undertaken on the cohesive Kimmeridge Clay and recorded a CBR value ranging of 0.1% to 6.4%. Low CBR values of less than 1% may have arisen due to significant sample disturbance.

Ten DCP TRL probes were advanced across the site area, and in general recorded CBR values ranging from 0.43% to 145.15%, and a marked increase in CBR value with depth was recorded. Low CBR values of less than 1% are likely to be representative of topsoil deposits which would not be a suitable subbase for pavement or highway construction and would need to be stripped during site wide enabling works.

The overall CBR recorded across the site is variable and is anticipated to respond to the changes in lateral ground conditions encountered.

Pavement and road design should be based upon a suitable (equilibrium) CBR value for such formation soils. It is recommended that new road pavement and road construction design should be based upon a CBR value of about 2-5%. Areas of soft ground should be excavated when identified during proof rolling. A conservative estimate for the cohesive Kimmeridge Clay and RTDs ranges from 2-3%, while granular RTDs can be expected to fall within the range of 4-5%.

However, the design value will need to be reviewed and confirmed by suitable in-situ testing at formation levels following earthwork operations and prior to pavement construction.

Notwithstanding this, the formation at all levels should be proof-rolled prior to pavement construction, and any soft zones thus revealed should be excavated out, with the resulting excavation in-filled with appropriately graded engineered granular fill.

It would be prudent to adopt a relatively low CBR in the preliminary design and to open discussions with the local authority highways department in order to agree pavement design approaches. This should be done at an early stage, as design traffic, drainage arrangements and thickness/stiffness of a pavement all play a part in achieving a satisfactory performance and an adoptable design.

# 6.4 Ground Floor Slabs

In accordance with NHBC guidance 5.1 "substructure and ground bearing floors", shrinkable soil, expansive materials or other unstable soils may require suspended floor construction. Shrinkable soils are classified as those containing more than 35% fine particles (silt and clay) and have a modified Plasticity Index of 40% or greater (see NHBC Chapters 4.2 'Building near trees' (each section) and 5.2 'Suspended ground floors' (each section)).

The majority of site soils do meet this criteria of "shrinkable soil", hence suspended ground floors are likely to be required to avoid problems of heave and shrinkage settlements.

# 6.5 Foundations

It is understood that the development will comprise both low rise residential dwellings with gardens and associated infrastructure and high rise mixed use blocks along main access and egress routes. Therefore this assessment has been split to consider two broad development options. It is understood that site levels are to be raised by approximately 0.50m in some areas.

Where filling has occurred, minimum founding depths will need to take this into consideration. Soil moisture deficit tests may be required, or alternatively, the minimum depth could be derived based on original pre-fill ground levels.

#### Low Rise Residential

For low rise residential dwellings, it is thus assumed loadings will be modest, however the required loadings have not been provided for this assessment. Made Ground soils are not considered to be a suitable founding stratum.

The target founding stratum will ideally be the Kimmeridge Clay Formation due to its fairly uniform properties and the increase in strength with depth which has been recorded consistently across the site. The RTD's are generally variable and the interbedded nature of the granular and cohesive strata would make founding more difficult with greater uncertainty of settlement response.

A number of foundation solutions are deemed viable including strip foundations, mass trench fill, or mini piles in areas where competent strata is encountered at a depth of greater than approximately 2 mbgl. This is primarily due to the variation in the depth that the Kimmeridge Clay formation was encountered across the development area. In general trench or strip foundations are not economical at depths of greater than 2 mbgl. Groundwater entry and the control required to maintain dry conditions prior to concrete pours is another consideration and likely to be more of a limitation within more granular water bearing RTDs.

The increase in site levels to the north of the site by 0.50m may lead to the requirement of more plots requiring a deeper founding solution.

Foundation excavations may require de-watering works due to the shallow nature of groundwater which has been encountered at the subject site.

In areas where the River Terrace Deposits are present and deemed viable as a founding stratum, a raft or semi-raft foundation may be preferred to help control and minimise the effects of differential settlements. It is recommended that once fixed development plans become available, settlement analysis is undertaken.

Detailed pile designs (in terms of pile type, depths, and method of installation) would be dependent upon the required working loads and should be undertaken in conjunction with a reputable, specialist, piling contractor; ideally with local experience.

If the hotspots of contamination are to remain on site (rather than excavation and removal) piling works in that area should adhere to the EA guidance on piling through contaminated soils, so as to prevent any mobilisation of contamination into underlying natural soils.

#### **High Rise Mixed Use**

The required loadings for high rise development has not been provided for this assessment. Made Ground soils are not considered to be a suitable founding stratum.

The target founding stratum will ideally be the Kimmeridge Clay Formation due to its fairly uniform properties and the increase in strength with depth which has been recorded typically across the site. It is envisaged that a pile design will be able to utilise both end bearing and shaft friction properties of the clay.

Detailed pile designs (in terms of pile type, depths, and method of installation) would be dependent upon the required working loads and should be undertaken in conjunction with a reputable, specialist, piling contractor; ideally with local experience.

If the hotspots of contamination are to remain on site (rather than excavation and removal) piling works in that area should adhere to the EA guidance on piling through contaminated soils, so as to prevent any mobilisation of contamination into underlying natural soils.

## 6.6 Buried Concrete

In accordance with BRE Special Digest 1 2005 Third Edition, "Concrete in Aggressive Ground, and results of BRE BR 279 Chemical Analysis, below ground concrete should comply with Table C1 design sulphate class DS-2 and ACEC class AC-2. Design/mix of buried concrete should be undertaken in accordance with these classifications.

# 7 Other Development Considerations

# 7.1 Material Management

In the case of managing soil movements or earthworks (the north of the site is due to be raised by 0.50m) it is important to also manage the intention to re-use materials, if a genuine need for the materials exists.

This will help avoid unnecessary additional regulation that can sometimes arise from a "waste management" perspective.

Providing materials are suitable for use, both chemically and geotechnically, and that re-use is certain, regulators should be able to agree that such materials do not need to enter the waste regulation system. A good to manage this risk is via development of a Materials Management Plan (MMP) in line with the CL:AIRE Code of Practice.

If certain materials do require regulation as waste exemptions have changed significantly in recent years and there are strict limitations on the quantity of soil that can be used and the thickness to which it can be deposited. The use of a permit could stigmatise the site for future conveyance. It is on this basis that we would recommend the development of the MMP route.

The MMP once drafted would be reviewed together with the approved site investigation and remediation documents by a Qualified Person, with their Declaration being issued to the Environment Agency; ultimately allowing the development to go ahead under a self regulation approach.

The development of an MMP will require a "Cut and Fill" model or a detailed materials management strategy to identify the sources of and destinations for site-won materials. It is envisaged that site formation levels within the north of the site will be raised by 0.50m, so formation levels will be designed to accommodate the required thickness of construction build-ups, without the requirement for offsite disposal of significant quantities of Made Ground soils.

If removal of the hot spot areas was undertaken, such materials would be waste and would require disposal at an appropriate waste facility.

# 7.2 Hot Spot areas and Excess Arisings

On the basis of the current information it is likely that if materials became excess to requirements, the majority of the Made Ground and natural soils would classifiy as "Inert" for landfill disposal. However a couple of potentially hazardous hotspots have been identified within samples tested at the site.

An appropriate waste classification can only be undertaken on the material due to be disposed of via further chemical testing; which should be completed prior to making disposal arrangements. In all cases where excess soils require off-site disposal, the materials need to be managed under the appropriate waste legislation and consideration given to any remedial techniques that could be used to improve the soil.

For Inert Waste and Hazardous Waste disposal, an allowance will need to be made for adequate Waste Acceptance Criteria (WAC) testing with appropriate consideration of the additional time and cost associated with this.

# 7.3 Health, Safety & Environment

Whilst very few samples tested were found to have contamination at concentrations of regulatory concern, there remains a low potential for more-significantly impacted soils to be encountered; consideration should therefore be given to the level of PPE that should be provided to future site operatives. A watching brief should be established to check for such as yet undiscovered impact.

All work on site should be conducted in accordance with appropriate Health and Safety guidance, with particular reference to HSG66 (HSE, 1991).

Care should be taken to minimise the risk of potentially contaminative incidents occurring during redevelopment. Good working practices should be adopted during construction works in order to minimise the risk of contamination occurring as a result of spillage or leakage of fuels, oils or chemicals stored or used at the site during re-development. All such materials should be sited on an impervious base within a bund and

should be adequately secured. In particular, care should be taken to prevent fuel, oils or other mobile contamination sources from entering any surface water drains at the site.

Throughout all redevelopment works, due regard should be given to potential detrimental effects on the surroundings including noise, vibration, odour and dust.

# 7.4 Potable Water Supply

There are currently no (fully adopted) national Standards for the protection of potable water supply pipes in potentially contaminated ground. However, the UKWIR has published guidance in this respect and site testing should be undertaken with due recognition of this guidance.

On the basis of the ground conditions encountered, it is unlikely that specific protection measures may be required for potable water supply for the development. It is recommended that consultation is undertaken with the local supplier to confirm this and a Water Pipeline Risk Assessment undertaken.

### 8 Conclusions and Recommendations

#### 8.1 Conclusions

Arcadis Consulting (UK) Limited (Arcadis) was instructed by Homes England, 'the Client', to undertake a ground investigation at the proposed site, known as Parcel 2A within the Phase 2 Boundary, Northstowe, Cambridgeshire.

The investigation has provided supplementary data. This report is based on the combined data of several reports, including the most recent.

The main Parcel 2A development area is approximately 8.5 hectares and generally flat, sloping slightly to the north and east. The area included parts of the former RAF Oakington and former barracks.

No specific point sources of contamination have been identified on site. Sampling has therefore been undertaken on a spatial coverage basis.

Historically, a sewage treatment works was present beyond the north eastern boundary of the site and the open space beyond the site boundary towards the existing settlement of Rampton Drift supported the former bomb storage and associated infrastructure. However, both these potential sources of impact are off-site and not considered to have the ability to impact the site.

The Ground investigation identified Made Ground deposits overlying the River Terrace Deposits and the cohesive Kimmeridge Clay Formation.

Concentrations above the appropriate SSVs for Lead, PAHs and TPH were identified within only two samples obtained during the intrusive investigation. Additionally, loose chrysotile asbestos fibres were identified in one sample (TP2A06). The underlying natural deposits across the site have been found to be "non-contaminated".

The driving exposure pathways for the metals, PAH and TPH (greater than C12) comprise direct exposure pathways including soil ingestion/inhalation and dermal contact. Therefore, in areas with buildings/external hard-standing or similar, no such potential pollution linkage would exist, and hence no specific remedial measures would be required. However, in the areas of soft landscaping and private garden areas the potential contamination linkage will need to be broken either by source removal (excavation and disposal) or by capping with a suitable thickness (likely to be 600mm) of uncontaminated cover soils. In general landscaping areas this thickness could likely be reduced. Clean cover soils in landscaped areas will also prevent new planting from being affected by phytotoxic conditions.

The hotspot should be delineated and the impacted soils could then be removed and disposed of to an appropriate waste treatment facility (likely to be hazardous waste due to TPH greater than 1000mg/kg). Once removed offsite, the soils left in-situ would be validated to confirm their suitability to remain onsite. If suitable, no further remedial measures are likely to be required for the proposed development.

The primary exposure pathway for asbestos fibres is inhalation/ingestion. The asbestos hotspot could be delineated and left in-situ and managed through an asbestos management plan detailed within a remediation strategy, if present in an area of permanent hardcover, or excavated and removed offsite to an appropriate waste disposal facility, if it coincides with garden or soft landscape areas.

Gas concentrations and flow rates recorded at the subject site indicate that the site is classified as Characteristic Situation 1, very low risk, and as such no special protection measures are likely to be required to protect the proposed structures from hazardous ground gas.

Minor Selenium exceedances of the WQS have been recorded within the groundwater samples however these are deemed to be minor and are most likely representative of background concentrations. Therefore, the risk to Controlled Waters is low.

Adequate soakage potential is likely to be present within areas where River Terrace Deposits are present and proven to be extensive, however application of standard designs is likely to have limited potential due to the high groundwater level, and the resultant absence of an adequate unsaturated zone beneath soakaways. Based on the available data, it is considered likely that perched groundwater will be encountered in shallow excavations (i.e. <2.0mbgl) at the site, especially during periods of wet weather. Appropriate groundwater control/dewatering provisions are likely to be required in excavations.

#### 8.2 **Recommendations**

Contaminant sources have been identified in two locations and pollutant linkages are considered present. In order to satisfy and enable the discharge of the likely future relevant Planning Conditions (including precommencement conditions), it is recommended that the findings of this report (with respect to contamination) be formalised in a development-specific Remediation Statement (detailing the chosen remedial option) and be submitted to the Local Planning Authority for their approval once fixed development plans are available for the site.

While contamination of concern has been encountered infrequently on site during the investigation, during the redevelopment of the site a watching brief approach should be adopted. If any evidence of significant made ground or visual or olfactory evidence of contamination is encountered during excavation works, work in that area should be suspended and analysis should be undertaken to determine if the material can remain on site. Whilst the contractor should be responsible for the watching brief, inspection of any finds and sampling should be undertaken by an experienced Geo Environmental Engineer.

Whilst contamination levels are typically not elevated, it is recommended that construction workers use appropriate PPE during the redevelopment.

A number of foundation solutions are deemed viable, and these will need to respond to the variable geology encountered and the differing development proposals. In general trench or strip foundations are likely to be suitable, but not generally economical at depth of greater than 2mbgl.

The site is underlain by high plasticity cohesive soils, hence foundation depths will need to be taken down beneath materials susceptible to unacceptable shrink-swell and suspended ground floors are likely to be required to accommodate differential movement. Guidance such as that provided by NHBC for construction on clay soils should be followed. Where filling has taken place, depths may need to reference original ground levels, as soils beneath may not have reached their new equilibrium moisture profile.

Owing to the requirement for site levels to be raised by 0.50m in the north of the site the re-use or importation of materials should be discussed with regulators, and controlled under a Material Management Plan. Use of the CL:AIRE CoP or similar good practice is recommended to help secure maximum re-use opportunities for site soils, and minimise risk of materials requiring additional and potentially unnecessary regulation as waste.

Contaminated materials being excavated for off-site disposal and other materials excess to requirements and requiring disposal will be waste and will require management under appropriate waste regulations.

Early consultation with local authority highways is recommended to help inform selection of design CBR.

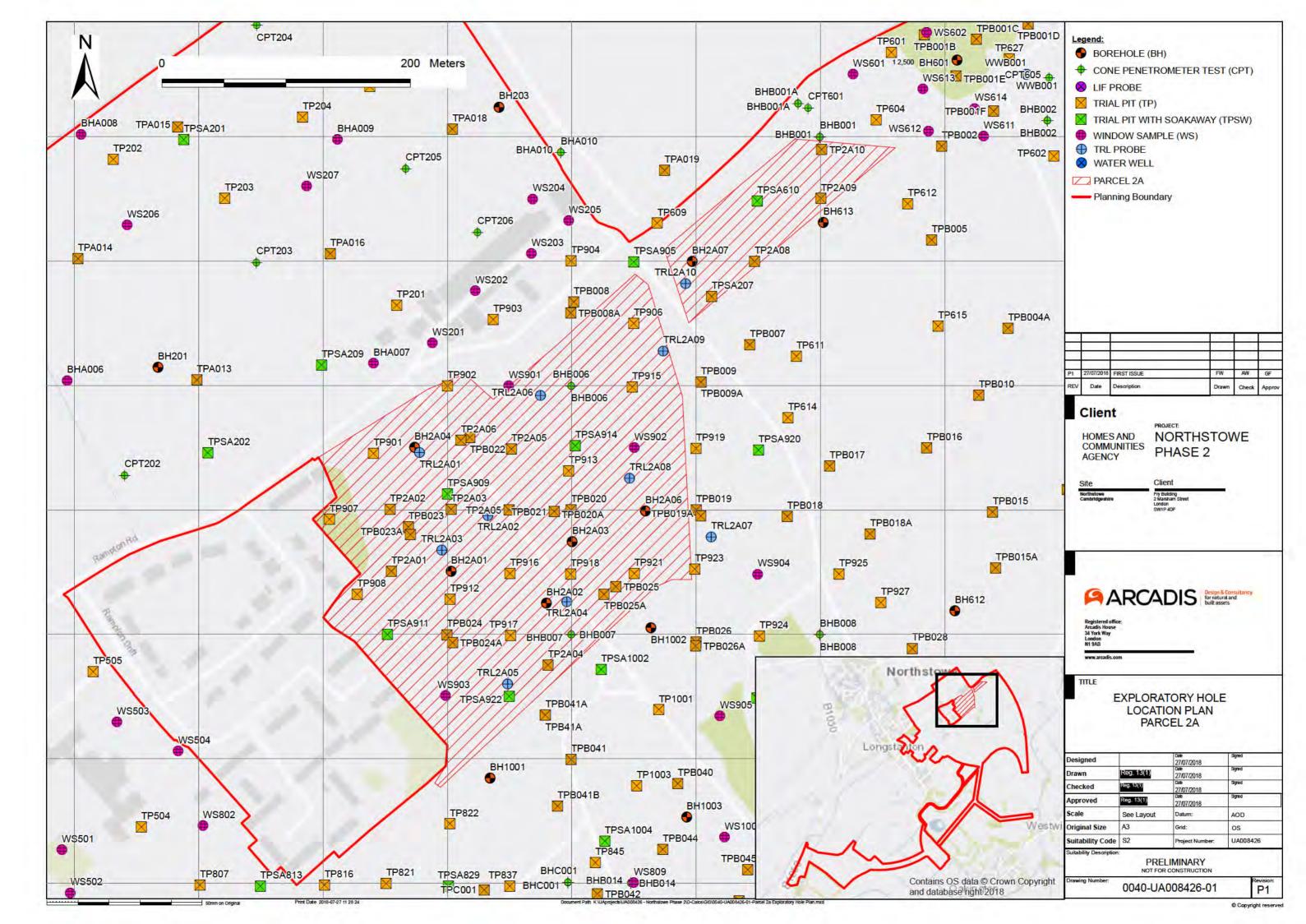
It is unlikely that specific protection measures will be required for potable water supply. It is recommended that consultation is undertaken with the local supplier to confirm this and a Water Pipeline Risk Assessment undertaken.

### 9 References

- 1. Hyder Consulting (UK) Limited (2014) Northstowe Phase 2 Geo Environmental Assessment and Outline Remedial Strategy Report (Report Number 5025-UA006156-UP31R-01)
- 2. Arcadis Consulting (UK) Limited (2017) Northstowe Phase 2, Ground Investigation Report (Report Number UA008426-AFS-GLR-G001)
- 3. Arcadis Consulting (UK) Limited (2017) Northstowe Phase 2 Geotechnical Interpretative Report (Report Number NOR-ARC-P2-XXX-RP-G-0138-P01)
- 4. Arcadis Consulting (UK) Limited (2017) Northstowe Phase 2 Development, Geo-Environmental Assessment Report / Outline Remedial Strategy (Infrastructure) (Report Number NOR-ARC-P2-XXX-RP-G-0137-P01)
- 5. Arcadis Consulting (UK) Limited (2018). Northstowe Phase 2 Parcel 2A Factual Ground Investigation Report (Report Number UA00XXXX-AFS-GLR-G001)
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- 7. Defra (2012) SP0101 Development of Category 4 Screening Levels Main Report
- 8. CIRIA C665. (2007) Assessing Risks Posed by Hazardous Ground Gases to Buildings
- 9. CIRIA C552 (2001) Contaminated land risk assessment. A guide to good practice
- 10. The Water Supply (Water Quality) Regulations 2016 No 614
- 11. CDM Regulations 2015
- 12. Water Framework Directive (2000/60/EC)
- 13. Highways Agency (2009) IAN 73/06
- 14. WSP Environmental (UK) (2007) Northstowe Zone B Interim Factual Report (Report Number 12170626)

# APPENDIX A

Combined Exploratory Hole Location Plan



# **APPENDIX B**

Soil Screening Values

Compound name	Soil Screening Values (mg/kg)
	Residential with plants
Arsenic	37
Boron	290
Cadmium	11
Chromium	910
Chromium (hexavalent)	6
Copper	2400
Lead	220
Mercury	40
Nickel	130
Selenium	250
Zinc	3700
Free Cyanide	27
Total Cyanide	27
рН	6-9
PAH compounds (1% SOM)	
Acenaphthylene	170
Anthracene	2400
Benzo(a)anthracene	7.2
Benzo(a)pyrene	2.2
Benzo(b)fluoranthene	2.6
Benzo(k)fluoranthene	77
Benzo(ghi)perylene	32
Acenaphthene	210
Chrysene	15
Di-benzo(a,h)anthracene	0.24
Fluoranthene	280
Fluorene	170
Indeno(1,2,3-cd)pyrene	27
Naphthalene	2.3
Phenanthrene	95
Pyrene	620
Total Phenols (monohydric)	280
TPH Fractions (1%SOM)	
Aliphatic C5-6	42
Aliphatic C6-8	100
Aliphatic 8-10	27

Compound name	Soil Screening Values (mg/kg)		
	Residential with plants		
Aliphatic 10-12	130 (48) <sup>vap</sup>		
Aliphatic 12-16	1100 (24) <sup>sol</sup>		
Aliphatic 16-35	65000 (8.48) <sup>f,sol</sup>		
Aliphatic 35-44	65000 (8.48) <sup>f,sol</sup>		
Aromatic C5-7	70		
Aromatic C7-8	130		
Aromatic C8-10	34		
Aromatic C10-12	74		
Aromatic C12-16	140		
Aromatic 16-21	260		
Aromatic C21-35	1100		
Aromatic C35-44	1100		

# **APPENDIX C**

**Risk Assessment Definitions** 

Based on information presented in

- CIRIA C552 (2001) Contaminated Land Risk Assessment: A guide to good practice, and
- NHBC / EA/ CIEH (2008) R&D Publication 66: (Volume 1) Guidance for the Safe Development of Housing on Land Affected by Contamination

Risk assessment considers the identified sources, the potential receptors and the pathways linking them together.

The designation of risk is based upon the consideration of both:

- a. the severity of the potential consequence (this takes into account both the potential severity of the hazard and the sensitivity of the receptor)
- b. the magnitude of probability (ie likelihood)

(this takes into account both the presence of the hazard and receptor and the integrity of the pathway)

**Severity** (consequence) can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term. Definitions of different categories of severity are detailed in Table 1 below.

**Probability** can be defined as the chance of a particular event occurring in a given period of time. Definitions of different categories of probability are detailed in Table 2 below.

A pollutant linkage must first be established before tests for probability and consequence are applied. If there is no pollutant linkage then there is no potential risk.

Classification	Human Health	Controlled Water	Built Environment	Ecosystems
Severe	Irreversible damage to human health. Short term (acute) risk to human health. Concentrations present <u>likely</u> to result in "significant harm" as defined by Part 2a.	Substantial pollution of sensitive water resources.	Catastrophic damage to buildings, structures or the environment.	Major damage to aquatic or other ecosystem, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest.
Medium	Chronic damage to human health. Concentrations present that <u>could</u> result in significant harm.	Pollution of sensitive water resources or small scale pollution of sensitive water resources	Significant damage to buildings, structures or the environment	Significant damage to aquatic or other ecosystems.
Mild	Slight short term health effects to humans. Exposure to human health <u>unlikely</u> to lead to significant harm.	Pollution to non-sensitive water resources	Minor damage to sensitive buildings, structures services or the environment.	Minor or short lived damage to aquatic or other ecosystems.
Minor	Non permanent health effects to human health (easily prevented by means such as personal protective clothing etc)	Insubstantial pollution to non-sensitive water resources	Easily repairable effects of damage to buildings or structures	Harm (although not necessarily significant harm which may result in financial loss or expenditure to resolve. eg loss of plants in a landscape scheme).

#### Table 2 Classification of probability

(	
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an even will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an even could occur. However it is by no means certain that even over a longer period such an event would take place and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

(only applies if there is a possibility of a pollutant linkage being present)

#### **Classification of Risk**

Once the severity and probability have been classified for a pollutant linkage they can be compared to produce a risk category from very high risk to very low risk as shown in the matrix below.

Potential Consequence				
Severe	Moderate/Low	Moderate	High	∨ery High
Medium	Low	Moderate/Low	Moderate	High
Mild	Very Low	Low	Moderate/Low	Moderate
Minor	Very Low	Very Low	Low	Moderate/Low
Likelihood	Unlikely	Low	Likely	High

#### Table below describes the risk classifications

Risk Term	Description
Very High Risk	There is a high probability that significant harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action or there is evidence that significant harm to a designated receptor is already occurring.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However it is either relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that such harm would be relatively mild. Some remediation work may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely, at worst, that this harm if realised would normally be mild. Any subsequent remediation works are likely to be relatively limited.
Very Low Risk	It is a low possibility that harm could arise to a receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.



Arcadis (UK) Limited

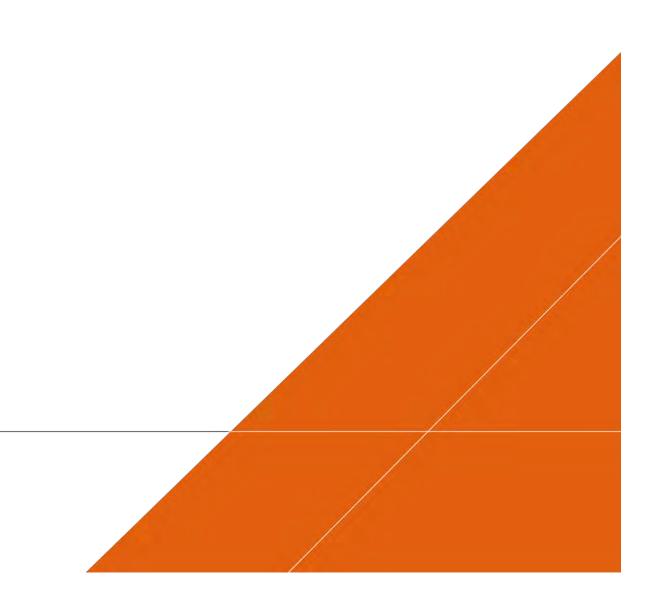
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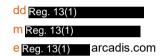
# **NORTHSTOWE PHASE 2 - PARCEL 2C** Ground Investigation Factual Report

May 2022



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### Northstowe Phase 2 - Parcel 2C

**Ground Investigation Factual Report** 

#### **Authorised Signatures**

Author	Reg. 13(1)	
Checker	Reg. 13(1)	
Approver	Reg. 13(1)	Reg. 13(1)
Report No	10052307-SER-G001	
Date	May 2022	

#### Version control

Version	Date	Author	Changes
00	May 2022	Reg. 13(1)	Original issue

This report dated May 2022 has been prepared for Homes England (the "Client") in accordance with the terms and conditions of appointment dated February 2022 (the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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APPENDIX B STANDARD PROCEDURES

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APPENDIX E MONITORING DATA

APPENDIX F GEOTECHNICAL LABORATORY TEST DATA

#### **APPENDIX G**

**GEO-ENVIRONMENTAL LABORATORY TEST DATA** 

### **1 INTRODUCTION**

Homes England propose to undertake the development of residential properties on the 2C parcel of land at Northstowe, Cambridgeshire. This ground investigation was commissioned by Homes England, 'the Client', to inform on the ground conditions at the site.

The scope of the ground investigation was determined by Arcadis Consulting (UK) Ltd, and the work was instructed in February 2022.

This report provides a factual account of the fieldwork undertaken including engineering descriptions of the various strata encountered, results of *in situ* testing, monitoring and the subsequent geotechnical and geoenvironmental laboratory testing undertaken on samples obtained.

#### 1.1 Limitations

This report has been prepared for the Client in accordance with the terms and conditions of appointment. Arcadis cannot accept any responsibility for any use of or reliance on the contents of this report by any third party. The copyright of this document, including the electronic format and any AGS data, shall remain the property of Arcadis.

Arcadis do not accept liability for any use of the information presented in this report unless it is signed by the author, checker and approver and marked as final.

It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, seasonal, and climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

#### 1.2 Proposal

The proposed development is expected to comprise circa 130 houses and a Neighbourhood Equipped Area of Play (NEAP).

#### 1.3 Existing Information

The following information relating to the site and the ground conditions was made available to Arcadis prior to mobilisation to the site:

a. 10018973-ARC-XX-XX-RP-YY-0004-03-Phase 2B Interpretive Report 2020; Arcadis Consulting (UK) Ltd [1] Northstowe Phase 2 - Parcel 2C

### **2 SITE DETAILS**

#### 2.1 Site Location and Description

The site is situated approximately 10km northwest of Cambridge at the approximate national grid reference of TL 402 672. Figure 2-1 below shows the site location.

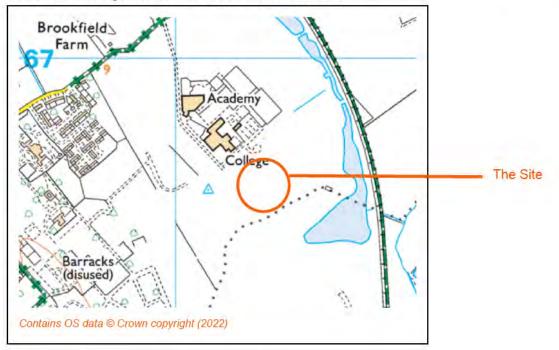


Figure 2-1 Site Location

The site is a defined plot of land, designated 2C, within the wider development of the new town of Northstowe. It currently comprises undeveloped open land which has been stripped of vegetation and is being used for the stockpiling of materials from the wider Northstowe development.

To the north is Northstowe Secondary College, to the northeast is open land (marked to be developed as a Sports Hub) while to the east and southeast is a grassed waterparks area with an associated play area. The site is bound to the south and west by a currently unnamed road.

The site is generally level, however the 2C parcel currently sits approximately 1m below the surrounding ground level of the adjacent roads and footpaths.

#### 2.2 Geology

The published 1:50 000 scale British Geological Survey (BGS) map of the area incorporating the site, Sheet 188 Cambridge [2], and the BGS OnShore GeoIndex [3] indicate the site is underlain by the Kimmeridge Clay Formation. The site is located adjacent to the boundary of the mapped River Terrance Deposits on the southern and eastern side indicating these deposits are unlikely to be laterally extensive across the site. The general distribution of the strata at the site is shown in Figure 2-2 below.

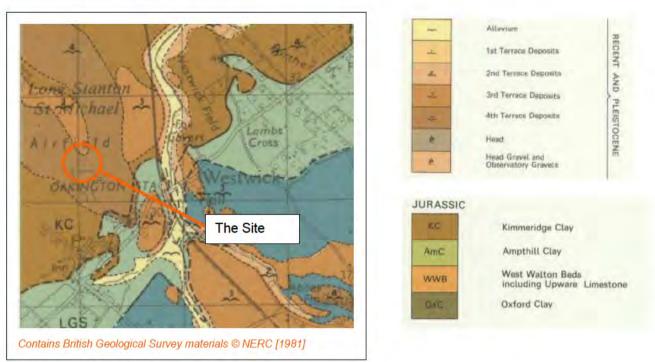


Figure 2-2: Geological Setting

The superficial River Terrace Deposits are described as "sand and gravel, locally with lenses of silt, clay or peat" [3]. These are underlain by the solid geology of the Kimmeridge Clay Formation which is described as "mudstones (calcareous or kerogen-rich or silty or sandy); thin siltstone and cementstone beds; locally sands and silts" [3].

Due to the sites history as an RAF facility and its current development, the likelihood of encountering anthropogenic materials side wide is high.

#### 2.3 Hydrogeology and Hydrology

The superficial deposits on the site are classified as Secondary A aquifer meaning permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers [4].

The Kimmeridge Clay Formation is classified as Unproductive Strata. Unproductive Strata is defined as "rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow" [4].

The site is not situated in a source protection zone.

The closest surface water feature is a newly created waterparks area consisting of soft landscaping and ponds approximately 300m east southeast of the plot. The site is not situated in a flood risk zone.

### **3 FIELDWORK**

#### 3.1 General

Ground investigation works were carried out in a single phase between 15<sup>h</sup> and 23<sup>rd</sup> March 2022. The scope of the ground investigation, including the location, scheduled depth and type of exploratory hole undertaken was determined by Arcadis Consulting (UK) Ltd and is summarised in Table 3-1.

The ground investigation methods were undertaken in general accordance with the principles set out in BS EN 1997-2:2004 [5] and with the general practice described in BS5930:2015+A1:2020 [6]. The geoenvironmental aspects of the ground investigation complied with the general requirements of BS 10175+A2:2017 [7].

Table 3-1 Initial ground investigation scope

Location ID	Hole Type	Scheduled Depth (m)	Requirements
BH2C101-BH2C104	CP	15.00	Determine thickness of engineering soils; collect representative samples of strata and undertake <i>in situ</i> tests
TP2C102,TP2C103,TP2C104,TP2C105,TP2C107,TP2C109,TP2C110,TP2C111,TP2C113,TP2C115,TP2C116,TP2C117,TP2C118,TP2C119,TP2C122,TP2C124TP2C124	TP	3.00	Determine thickness of engineering soils; collect representative samples of strata.
WS2C101, WS2C106, WS2C108, WS2C112, WS2C114, WS2C120, WS2C121, WS2C123	DS	3.00	Determine thickness of engineering soils; collect representative samples of strata and undertake <i>in situ</i> tests

#### Notes

TP = trial pitting, CP = cable percussive boring, DS = dynamic sampling.

The investigation works were carried out under the supervision of an Arcadis ground engineer who undertook the logging and reporting of the exploratory holes and *in situ* testing.

#### 3.2 Exploratory Holes

#### 3.2.1 Exploratory Hole Locations

The exploratory hole locations were set out using eastings and northings on site by a specialist survey firm and the elevations then established using a Trimble VRS NOW GPRS system.

#### 3.2.2 Investigation Methodology

The following methods and techniques were undertaken to construct the exploratory holes at the site.

Details of the methods of investigation and associated standards adopted and a key to the notation and symbols used on the logs is presented in are presented in Appendix B; the exploratory hole records are presented in Appendix C.

#### 3.2.3 Cable Percussive Boring

Cable percussive boring was completed using a trailer mounted Dando 2000 or Dando 2500 boring rig equipped with 200 mm and 150 mm casing and tools to undertake boreholes up to 15.45 m bgl.

Northstowe Phase 2 - Parcel 2C

Samples of the material recovered from the borehole were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were generally undertaken at 1.0 m intervals until 10 m depth and then were taken at 1.50 m intervals until the termination depth of the hole. These were alternated with open drive tube samples, taken using thin-walled sampling apparatus from the relatively undisturbed material at the base of the borehole.

#### 3.2.4 Dynamic Sampling

Dynamic sampling was completed using a track-mounted Competitor Dart sampling rig capable of driving windowless sampling tubes using a mechanical hammer dropped repeatedly from a self-governed height.

Due to the method of investigation, the materials recovered within the sampler apparatus were generally disturbed and were assessed as complying with Class 3 to Class 5 of BS EN 22475-2 [8]. Sub-samples of the material recovered in the liners were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and small bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Standard penetration tests (SPT) were undertaken using the track mounted rig 1.0 m centres until the termination depth of the hole.

#### 3.2.5 Trial Pitting

Trial pits were undertaken using a tracked mechanical excavator and pits were entirely logged from the surface and arisings.

Samples of the material recovered in the trial pits were taken to enable representative laboratory testing. Generally, small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was assessed as significant.

#### 3.2.6 Completed Works

Drawing 10052307-SER-EHP-0001 presented in Appendix A displays the as-constructed exploratory hole locations while the co-ordinates and elevation of the ground surface at each exploratory hole location are given on the individual logs. The completed scope of investigation is summarised in Table 3.2.

Location ID	Hole Typ e	Start Date	End Date	Final depth (m)	Termination Reason
BH2C101	СР	21/03/2022	21/03/2022	15.00	Terminated on target depth.
BH2C102	СР	17/03/2022	17/03/2022	15.45	Terminated on target depth.
BH2C103	СР	21/03/2022	22/03/2022	15.00	Terminated on target depth.
BH2C104	СР	22/03/2022	23/03/2022	15.00	Terminated on target depth.
TP2C102	TP	16/03/2022	16/03/2022	3.00	Terminated on target depth.
TP2C103	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.

Table 3-2. Summary of completed exploratory holes

#### Northstowe Phase 2 - Parcel 2C

Location ID	Hole Typ e	Start Date	End Date	Final depth (m)	Termination Reason
TP2C104	TP	16/03/2022	16/03/2022	3.00	Terminated on target depth.
TP2C105	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C107	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C109	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C110	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C111	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C113	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C115	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C116	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C117	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C118	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C119	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C122	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
TP2C124	TP	17/03/2022	17/03/2022	3.00	Terminated on target depth.
WS2C101	DS	21/03/2022	21/03/2022	2.25	Terminated on refusal.
WS2C106	DS	21/03/2022	21/03/2022	3.25	Terminated on refusal.
WS2C108	DS	15/03/2022	15/03/2022	3.15	Terminated on target depth.
WS2C112	DS	16/03/2022	16/03/2022	3.15	Terminated on refusal.
WS2C114	DS	16/03/2022	16/03/2022	3.45	Terminated on target depth.
WS2C120	DS	16/03/2022	16/03/2022	3.17	Terminated on refusal.
WS2C121	DS	21/03/2022	21/03/2022	3.45	Terminated on target depth.
WS2C123	DS	21/03/2022	21/03/2022	3.45	Terminated on target depth.

Notes TP = trial pitting, CP = cable percussive boring, DS = dynamic sampling.

#### 3.3 In situ Testing

### 3.3.1 Penetration Testing

#### 3.3.1.1 Standard Penetration Tests

Standard penetration tests (SPT) were carried out as required in the investigation scope and in accordance with the methods given in the standard procedures presented within Appendix B. Generally, tests were undertaken at regular intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil samples was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

The N-values as determined in the field are presented on the borehole logs as uncorrected values that do not take into account the energy losses or efficiency of the automatic trip hammer used to drive the test tool into the ground. The calibration certification for the test devices used in the investigation is presented in Appendix D and a summary of the SPT equipment used at each location is presented in Table 3-3.

Location ID	SPT Hammer Reference No.	Energy Efficiency Ratio, Er %
BH2C102	AR2521	78.98
BH2C101, 103, 104	AR2411	77.00
WS2C101, WS2C106, WS2C108, WS2C112, WS2C114, WS2C120, WS2C121, WS2C123	DART489	82.00

Table 3-3 Test Hammer Calibrations

#### 3.3.2 VOC Head Space Screening

The presence of Volatile Organic Compounds (VOC) within the ground was determined using a photoionization detector (PID) to detect the 'headspace' vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effected liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil core sample at regular intervals corresponding with environmental sampling by placing a small amount of material into a screw-top glass jar so that the jar was not more than half-full. The jar opening was covered with an aluminium foil sheet and the lid screwed on to form an air-tight seal. The sample and jar were then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

To assess the headspace vapour, the jar lid was removed and the PID probe was inserted through the foil into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix C.

The testing was undertaken using a MiniRAE Lite PID with a 10.6 eV lamp.

The PID instrument was calibrated regularly throughout the day using isobutylene reference gas concentrations.

### 3.4 Installations and Post-fieldwork Monitoring

#### 3.4.1 Installations

Installations to enable long term monitoring of the site were made in those boreholes selected by Arcadis Consulting (UK) Ltd and the details are summarised in Table 3-4 and are also provided on the relevant borehole logs.

Location ID	Installation Type	Response Zone Top m bgl	Response Zone Base m bgl
BH2C101	SP50	3.00	15.00
BH2C102	SP50	5.00	15.00
BH2C103	SP50	4.00	15.00
BH2C104	SP50	0.50	4.90
WS2C101	SP50	0.50	1.70
WS2C106	SP50	0.50	1.50
WS2C108	SP50	0.50	2.70
WS2C112	SP50	0.50	1.20
WS2C114	SP50	0.50	1.50
WS2C120	SP50	0.50	2.50
WS2C121	SP50	0.50	1.50
WS2C123	SP50	0.50	1.50

Table 3-4 Summary exploratory hole installations

Notes

SP50 = standpipe piezometer

#### 3.4.2 Post-fieldwork Monitoring

Post-field work monitoring was undertaken on three separate visits on  $5^{th} - 8^{th}$  April,  $12^{h} - 13^{th}$  April, and  $23^{rd}$  May 2022 to record land gas emissions and groundwater levels. During the first monitoring visit, after completion of the land gas emission monitoring, groundwater monitoring and sampling was undertaken. Where installations were purged dry, monitoring and sampling was conducted on groundwater recovered following recharging of groundwater in installations.

The results of the groundwater monitoring are presented within Appendix E.

### **4 LABORATORY TESTING**

#### 4.1 General

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

#### 4.2 Geotechnical Laboratory Testing

The geotechnical tests detailed in Table 4.1 were carried out in accordance with either BS1377:1990: Parts 1 to 8 [9]; BS EN ISO 17892: Parts 1 to 12 [10]; BRE SD 1:2005 [11]; or other methods as listed in Table 4.1. The complete results of the geotechnical laboratory testing are presented in Appendix F.

Table 4-1 Summary of geotechnical test data

Test	Method	No of Determinations
Moisture content	BS1377 Pt 2 - 3.2	37
4-point liquid and plastic limit	BS 1377 Pt 2 - 4.3 & 5.3	37
Particle Size Distribution - Wet sieving	BS1377 Pt 2 - 9.2	7
Particle Size Distribution - Sedimentation	BS1377 Pt 2 - 9.4	7
pH, water soluble sulphate; total sulphate, total sulphur, chloride, nitrate, magnesium	BRE SD1 preferred methods	12
One-dimensional Consolidation	BS1377 Pt 5 – 3	1
Quick Undrained Triaxial Compression	BS1377 Pt 7 – 8	9

### 4.3 Geo-Environmental Laboratory Testing

Geo-environmental tests were undertaken on soil, groundwater and prepared leachate specimens obtained from the samples collected from the site. Testing was carried out for the contaminants detailed in Table 4.1, Table 4.2. Details of the test methodology and results of the chemical laboratory testing are presented in Appendix G.

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn)	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	30
рН		30

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Cyanide Free and Total		30
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	28
Total Petroleum Hydrocarbon Criteria Working Croup (TPH CWG)	Gas Chromatography – Flame Ionisation Detector (GC-FID)	22
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)	Gas Chromatography –Mass Spectrometry (GC-MS)	22
Total Organic Carbon		2
Phenol (total), Cresol, Chlorinated Phenols		30
Hexavalent Chromium		26

Table 4-3 Summary of geo-environmental test data – groundwater matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn), pH, Cyanide Free & Total	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	8
PAHs	Gas Chromatography –Mass Spectrometry (GC-MS)	8
TPH CWG	Gas Chromatography – Flame Ionisation Detector (GC-FID)	8
SVOCs	Gas Chromatography –Mass Spectrometry (GC-MS)	8

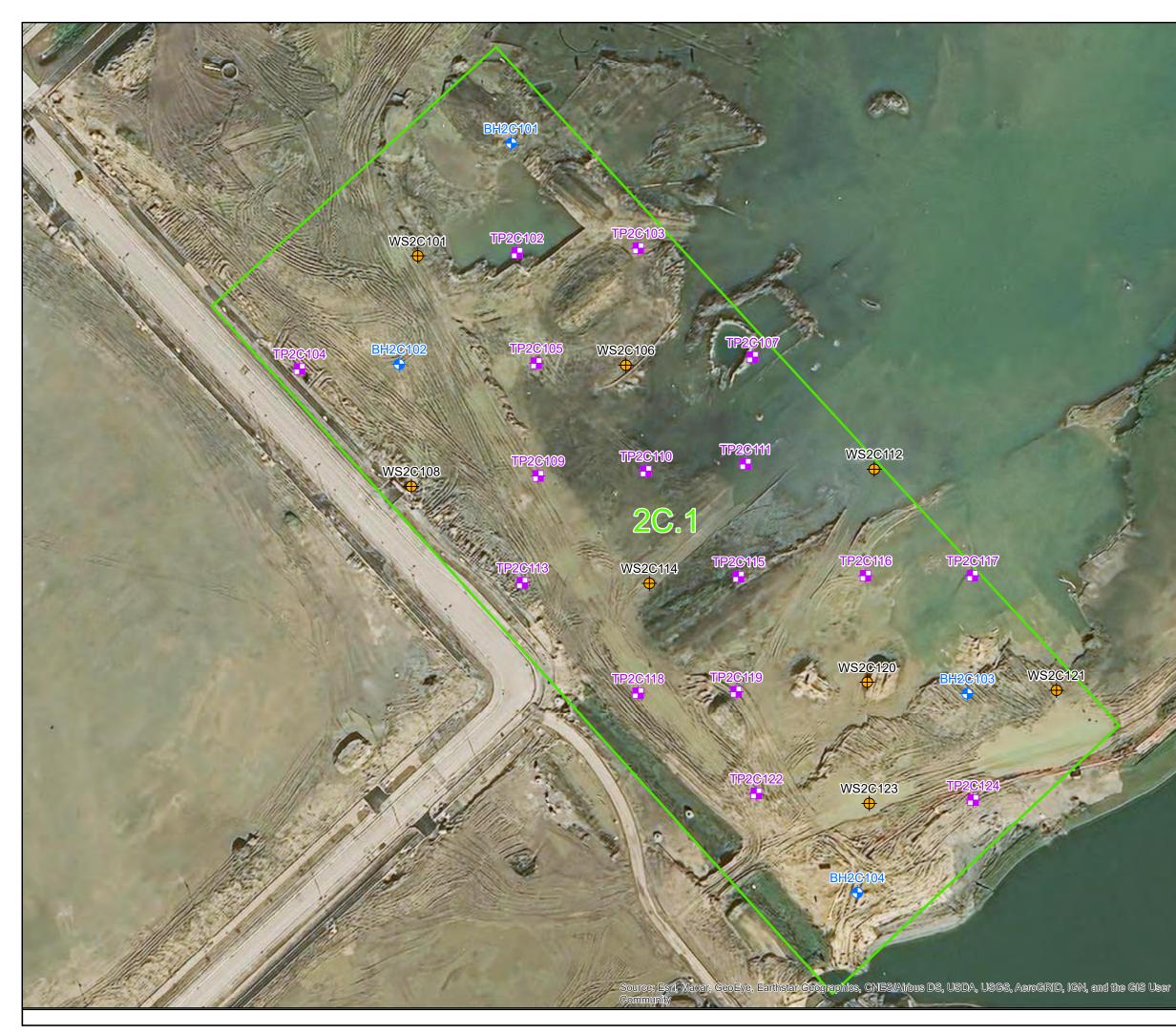
### **5 REFERENCES**

- 1. Arcadis Consulting (UK) Ltd. 2020. 10018973-ARC-XX-XX-RP-YY-0004-03-Phase 2B Interpretive Report.
- 2. British Geological Survey. 1982. Cambridge. England and Wales Sheet 188. Bedrock and Drift Deposits. 1:50 000. BGS Keyworth, Nottingham.
- 3. British Geological Survey, Onshore Geolndex http://www.bgs.ac.uk/data/mapViewers/home.html Accessed April 2022.
- Natural England Magic Map http://www.magic.gov.uk/MagicMap.aspx Accessed April 2022
- 5. BS EN 1997-1. 2004.+ A1 2013 *Incorporating corrigendum February 2009.* Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution.
- 6. BS EN 1997-2. 2007. *Incorporating corrigendum June 2010.* Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution.
- 7. BS 5930. 2015+A1:2020. Code of practice for ground investigations. British Standards Institution.
- BS 10175+A2. 2017. Investigation of potentially contaminated sites Code of practice. British Standards Institution.
- 9. BS 1377. 1990 & 2016 as amended. Method of test for soils for civil engineering purposes. Published in 9 Parts. British Standards Institution.
- 10.BS EN ISO 17892-1: Geotechnical investigation and testing Laboratory testing of soil Determination of water content. British Standards Institution.
- 11.Building Research Establishment. 2005. Concrete in aggressive ground. BRE Special Digest 1. 3<sup>rd</sup> Edition. BRE, Watford.

### APPENDIX A

### DRAWINGS

Drawing 10052307-SER-EHP-0001: Exploratory Hole Location Plan





### APPENDIX B

### STANDARD PROCEDURES

### B0 General Principles

This ground investigation was undertaken in general accordance with the principles of BS EN 1997-1 [1] and BS EN 1997-2 [2] and the advice given in BS5930:2015+A1:2020 [3], which, provides complimentary guidance on the application of the primary standards. Where the requirements of the ground investigation specification differ from these primary standards, the investigation methodology was adapted as required and specific notes regarding methods and techniques employed were made in the appropriate report sections.

#### B1 Buried Services

Service clearance was undertaken in accordance with Arcadis' Safety, Health and Environment (SHE) Standard – Avoidance of Sub-Surface Hazards and Structures Standard. This document details the methods and safe working practices used to undertake excavations safely. Prior to breaking ground, services plans were consulted and the area scanned using a Cable Avoidance Tool (CAT) with detected signals marked on the ground. For all investigation positions, other than for machine excavated trial pits, hand excavated inspection pits are completed to 1.20 m bgl prior to the use of drilling and boring plant.

#### B2 Sampling requirements

The selection of sample types and sampling techniques has been chosen to take account of the soil fabric, size and quality of sample required based on whether the soils mass properties or the intact material properties of the ground are to be determined in subsequent laboratory tests. BS EN ISO 22475-1[4] describes three generic sample groups that are:

- a. Sampling by drilling. Generally, a disturbed sample recovered from the drilling tool or digging equipment, typically meeting Class 3 to Class 5 requirements, with the recovered material being stored in bulk bags or sealed jar or tub containers.
- b. Sampling by sampler. Typically referred to as open tube or drive sampling in which a tube with a sharp cutting edge is driven into the ground either by static thrust or dynamically driven to give a relatively undisturbed sample of Class 1 or Class 2 but may result in a Class 3 sample.
- c. Block sampling. Cylindrical large diameter samples or cuboid hand-cut samples usually relatively undisturbed Class 1 and Class 2.

The open-tube sampling equipment used on the site was of a type and design that conformed to BS EN ISO 22475-1. For the purpose of this ground investigation block sampling was not required.

Generally, samples were assessed on site and any unexpected deterioration in sample quality was reported to the ground engineer by the lead drilling technician.

Sufficient and representative samples were taken to allow the geo-mechanical properties of the ground to be adequately characterised and to enable the sequence of soil strata to be described by an engineering geologist or geotechnical engineer.

Where samples have been taken for chemical tests the drilling method attempted to adopt dry drilling over the sampling range that generally was achieved by the use of drill casing to separate and isolate the upper soil layers and exclude groundwater. Cross-contamination was further reduced by regular cleaning of sampling tools. Sample integrity was maintained by sealing samples immediately on collection and storing the samples in a temperature controlled cool box. Samples were despatched from the site at the end of the shift on which they were collected or as

# required in the project specification. Details of best practice storage, preservation and decontamination measures undertaken are given below:

Task	Soil	Groundwater	Ground Gas	
Storage	Glass jars and vials supplied by the laboratory were used for the collection of soil samples to be analysed for volatile compounds. Plastic one-litre tubs were used to collect soil samples for metals analysis.		1.4L Canisters supplied by the laboratory.	
Preservation	Filling of sample containers as headspace and low storage te potential for volatilisation and l hydrocarbon compounds prior	Not required.		
Decontamination	Disposable gloves were worn and changed between sample collection to prevent cross-contamination. Groundwater samples were collected using dedicated disposable tubing / bailers, that were changed between monitoring well locations in order to prevent cross- contamination.		Disposable gloves were worn and changed between sample collection to prevent cross contamination.	
Transport	Samples stored in dedicated sample boxes provided by the laboratory. Sample details and analytical requests were recorded on the laboratory chain of custody form included with samples, prior to dispatching to laboratory for analysis. Samples were dispatched to the laboratory on the day of sampling.			

#### B3 Sample description

Sample description was undertaken by the Arcadis site geologist in accordance with BS 5930: 2015+A1:2020. The descriptions of the individual samples were used to identify the sequence of strata at the exploratory hole location and from which representative exploratory hole logs were drawn.

### B4 In situ testing

*In situ* geotechnical tests were undertaken taking account of the investigation scope and requirement to attain the appropriate parameters required in the geotechnical design. The tests were undertaken in accordance with the requirements of the relevant parts of BS EN ISO 22476 [5, 6, 7] and other methods as follows:

#### Standard penetration testing

Standard penetration tests were carried out in accordance with BS EN ISO 22476-3, BS EN 1997-2 and the national Annex to BS EN 1997-2. The test records are presented on the borehole logs as blow counts for each increment with the N-value as the total number of blows of the four main test increments.

Where the N-value exceeds a total of 50 blows, the test reports the penetration in millimetres for the last test increment recorded, and the N value is indicated as greater than 50,

#### e.g. 4,5/12,14,18, 6 for 10 mm

indicates that the seating blows (4 and 5) were completed and that the test terminated in the 4<sup>th</sup> increment after penetrating 10 mm.

Where the seating blows exceeded 25 blows for less than 150 mm; the test was stopped and the rods remarked after which, the main drive was continued. The test is then reported as the number of blows in each seating drive for the recorded penetration with the results of the main drive given as above,

e.g. 14/11 for 45 mm/12,14,16, 8 for 10 mm.

In certain circumstances where groundwater in-flow may affect the test, particularly in fine sand or silt, low SPT blow counts may be recorded. Where the SPT blow count was very low, N values of 5 or less, the test was, at the discretion of the site engineer, continued for a further 300 mm, recording blows for each 75 mm increment. **This is not** a standard penetration test value, it does however give an indication of potential disturbance to the ground.

#### B5 Data transfer format

The data collated during the ground investigation has been organised and managed using the "AGS data format" that allows data transfer between different disciplines and organisations in accordance with BS 8574 [10].

#### B6 References

- 1. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
- BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
- 3. BS 5930: 2015+A1:2020. Code of practice for ground investigation. British Standards Institution.
- 4. BS EN ISO 22475-1. Geotechnical investigation and testing Sampling methods and groundwater measurements Part 1 Technical principles for execution.
- 5. BS EN ISO 22476-3 2005. Geotechnical investigation and testing Field testing Part 3: Standard penetration test. British Standards Institution
- 6. BS 1377-9. 1990. Methods of test for soils for civil engineering purposes. Part 9: In-situ tests. British Standards Institution.
- 7. BS 8574. Code of practice for the management of geotechnical data for ground engineering projects.

Northstowe Phase 2 - Parcel 2C

# B7 Exploratory Hole Key



### Key to Exploratory Hole Symbols and Abbreviations

Environmental soil sample

SPT split spoon sample

Gas sample

Liner sample

L

SPT

Environmental water sample

U

UT

W

#### SAMPLE TYPES

В	Bu k disturbed sample	ES
С	Core sample	EW
CBR-D	Disturbed sample from CBR test area	G

- CBR-U Undisturbed sample from CBR test area
- D Small disturbed sample

#### **IN-SITU TESTING**

- SPTs Standard Penetration Test (using a split spoon sampler)
- SPTc Standard Penetration Test (using a solid 60 degree cone)
- N Recorded SPT 'N' Value \*
- -/- Blows/Penetration (mm) after seating blows totalling 150 mm
- MX Mexi Probe Test (records CBR as %)
- HV Hand Shear Vane Test (undrained shear strength quoted in kPa)
- PP Pocket Penetrometer Test (kg/m<sup>3</sup>)
- () Denotes residual test value
- PID Photo Ionisation Detector (ppm) \*
- Kf/Kr Permeability Test (f = falling head, r = rising head quoted in ms<sup>-1</sup>)
- HPD High Pressure Dilatometer Test (pressure meter)
- PKR Packer / Lugeon Permeability Test
- CBR California Bearing Ratio Test

#### ROTARY CORE DETAILS

- TCR Total Core Recovery, %
- SCR Solid Core Recovery, %
- RQD Rock Quality Designation (% of intact core >100 mm)
- FI Fracture Spacing (average fracture spacing; in mm, over indicated length of core) \* \*
- NI Non-Intact Core
- AZCL Assumed Zone of Core Loss

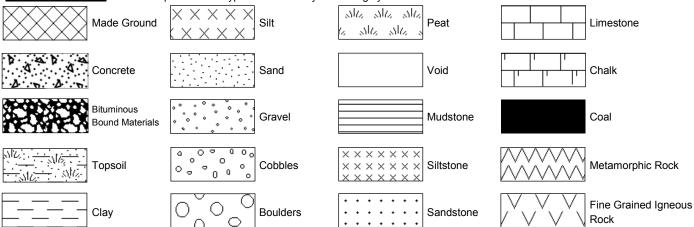
#### GROUNDWATER



Groundwater strike

Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

STRATA LEGENDS - Note: Composite strata types are shown by combining symbols



\* Where a single value is quoted this is the uncorrected 'N' value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

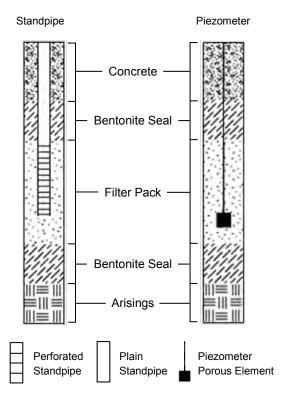
\* \* The minimum, average and maximum are shown e.g. 5/45/125

#### **INSTALLATION & BACKFILL DETAILS**

Undisturbed sample

Water sample

Undisturbed thin wall sample



STRATUM BOUNDARIES

Unit boundary

### APPENDIX C

### EXPLORATORY HOLE LOGS

orthstowe <sup>ient</sup> omes England	d					Easting (OS mE) Northing (OS mN) End I 541306.84 266608.07 21/	03/2022	Sh	neet 1 d	of 2
Samples		Tests		Progr	ess	Strata		1.550		Inch
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water	Description	Legend	Depth (Thickness)	Level	Inst Bac
(86) 0.10-0.50			Deput	21/03/2022	Depth 0.00 Dry	MADE GROUND: Soft dark brown very gravelly CLAY with	XXX			4.
(ES1) 0.20-0.30	PID (1) 0.20	<1ppm		05.00	Diy	occasional rootlets. Gravel is subangular to subrounded fine to coarse of flint ,chert, brick.		•	Ŧ	4
(B7) 0.50-1.00 (ES2) 0.50-0.60	PID (2) 0.50	<1ppm				[MADE GROUND]		(4.20)	ŧ P	4.
								(1.30)	ŧ	1
1		and the second							ŧ	1
(B9) 1.20-1.65 (D8) 1.20-1.65	SPT(S) 1.20 PID (3) 1.30	N=10 (2,2/2,3,3,2) <1ppm	Dry			Firm to stiff light bluck some slightly site OLAV		1.30	10.17	1
(ES3) 1.30-1.40						Firm to stiff light bluish grey slightly silty CLAY. [KIMMER DGE CLAY FORMATION]	x		ŧ	10
		4.4					x		Ē	2
(U10) 2.00		U10 59 blows 60%rec.	Dry				x	(1,10)	‡ }	1
(UT10) 2.00-2.45		UT10 59 blows 60%rec.	Dry				x_x-		ŧ	4
(D11) 2.45-2.50						Weak light grey SILTSTONE.	XXXXX	2.40 2.50	9.07	1
						(KIMMER DGE CLAY FORMATION]	/F===	2.00	1	25
(B13) 3.00-3.50	SPT(S) 3.00	N>50 (25 for 25mm/50	Dry			Very stiff dark bluish grey CLAY with occasional daystone bands. [KIMMER DGE CLAY FORMATION]			ŧ	1
(D12) 3.00-3.11 (ES4) 3.00-3.10	PID (4) 3.00	for 70mm) <1ppm	Diy						f F	
							12-2		‡ [	
							F==		Ŧŀ	
									ŧ [	ŝ.
(UT14) 4.00-4.45		UT14 52 blows 90%rec.	Dry				EE		Ē	
(D4D) 4 45 4 50		1.1							f f	S, F
(D15) 4.45-4.50							FE		ŧ	-
		and a state of the							ŧ ŀ	F
(B16) 5.00-5.50 (ES5) 5.00-5.10	SPT(C) 5.00 PID (5) 5.00	N=46 (6,13/14,14,9,9) <1ppm	Dry						F	
	10000						-5-5		ŧ	
		1.0.0					EE		Ŧ	
							EE		ŧ	Ē
(UT17) 6.00-6.45		UT17 42 blows 95%rec.	Dry						‡	
		1					121	(9.50)	Ŧ	
(D18) 6.45-6.50							FE		ŧ	
(C. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.									ŧ ŀ	2 E
(B20) 7.00-7.50	SPT(S) 7.00	N=19 (3,4/4,5,5,5)	Dry			Becoming firm.	E.		ŧŀ	A F
(D19) 7.00-7.45	C.C.C.C.C.C.P					Becoming tim.	-E-E		ŧ	
							23	3	£ F	
							12	1 3	ŧ	S F
(UT21) 8.00-8.45		UT21 47 blows 100%	Dry						ŧ	
(0121)0.00-0.45		rec.	Luy				-2-2		f F	N.F
(D22) 8.45-8.50		1					F273		ŧ	
		1 2 4 7							E l	
Sector Sector									1	
(B24) 9.00-9.50 (D23) 9.00-9.45	SPT(S) 9.00	N=23 (4,6/5,6,6,6)	Dry						F	·
1									ŧĿ	
í							E-E-F		Ē	
(UT25) 10.00-10.45		UT25 58 blows 90%rec.	Dry						Ē	
DR LLING T	TECHNIQUE Type	CHISELL Hard Strata From To	NG Duratio	n Date & T		VATER OBSERVATIONS HOLE/CASING DIAM pth Strike Time Elapated Rise To Ceating Seeded Hole Dia. Depth Casing Dia.	Depth		R ADDE	ED olume
0.00 1.20 1.20 15.00	Inspection Pit Cable Percussion					(mins) Cacing Sealed 200 15.00 200	3.00			
			1							
emarks orehole terminated	on Engineer's In	nstruction on achieving	target de	epth.						
o groundwater enco	ountered.	a deligent a sel ca se								
and the second se	and the second second	1.1.1						Term	ination De	epth:
								-	15.00	1

Samples         Tests         Progress         Strata         Dept           Type + Depth         Type + Depth         Results         Water Depth         Date & Time         Casing & Meght         Description         Legend         Thick on Thick on           (D26) 10.45-10.50	thstowe nes Englan				Project No. 10052307 Easting (OS mE) 541306.84	Ground Leve 11.47 Northing (OS 266608.1		End Da	3/2022		<sup>ale</sup> 50 neet 2	of 2
Type + Depth         Type + Depth         Results         Water Depth         Deate a Trme         Wey best         Description         Legand         (Thickn (Thickn)           (D26) 10.45-10.50 </th <th></th> <th>Progr</th> <th>-</th> <th>SS</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>1.50.</th> <th></th> <th></th>		Progr	-	SS						1.50.		
(D26) 10.45-10.50         Very stiff dark bluish grey CLAY with occasional daystone bands. [KIMMER DGE CLAY FORMATION]           (D27) 11.00-11.10         N=27 (5,66,6,7,8)         Dry           (B29) 11.50-12.00 (D28) 11.50-11.95         SPT(S) 11.50         N=27 (5,66,6,7,8)         Dry           - (030) 12.00-12.10         N=27 (5,66,6,7,8)         Dry         Weak light grey SILTSTONE recovered at angular to subrounded [KMMER DGE CLAY FORMATION]         12.0           - (030) 12.00-12.10         N=36 (5,778,6,9,11)         Dry         Very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]         12.0           - (031) 13.00-13.50         SPT(C) 13.00         N=36 (5,778,6,9,11)         Dry         Very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]         (2.30           - (032) 14.00-14.10         UT33 49 blows 100% rec.         Dry         2103/02/2         3.00         15.0	ype + Depth	& Time		Casing & Water	In the second	Descripti	ion		Legend	Depth (Thickness)	Level	Install/ Backfil
(829) 11.50-12.00 (028) 11.50-11.95       SPT(S) 11.50       N=27 (5,66,6,7,8)       Dry       Weak light grey SILTSTONE recovered at angular to subrounded fine to coarse gravel. [KIMMER DGE CLAY FORMATION]       12.0         - (030) 12.00-12.10       N=36 (5,778,8,9,11)       Dry       Very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]       12.7         - (031) 13.00-13.50       SPT(C) 13.00       N=36 (5,778,8,9,11)       Dry       Pressential       21/03/2022       3.00       12.0         - (034) 14.95-15.00       UT33 49 blows 100% rec.       Dry       21/03/2022       3.00       15.0	26) 10.45-10.50		Coput	Deptn	Very stiff dark bluis [KIMMER DGE CL	h grey CLAY with AY FORMATION	h occasional clayston ]	ne bands.				
(D28) 11:50-11:95	27) 11.00-11.10										ŧ	
- (B31) 13.00-13.50         SPT(C) 13.00         N=36 (5,7/8,8,9,11)         Dry         Very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]         12.71           - (B31) 13.00-14.10	28) 11.50-11.95		Dry								ţ	
- (B31) 13.00-13.50 SPT(C) 13.00 N=36 (5,7/8,8,9,11) Dry Very stiff dark bluish grey CLAY. - (D32) 14.00-14.10 - (UT33) 14.50-14.95 UT33 49 blows 100% Dry rec. Dry rec. 21/03/2022 3.00 15.00	12.00-12.10				Weak light grey SI fine to coarse grav [KIMMER DGE CL	LTSTONE recove el. AY FORMATION	ered at angular to sub ]	brounded	*****	(0.70)	-0.53	
- (D32) 14.00-14.10 - (UT33) 14.50-14.95 - (D34) 14.95-15.00 - (D34)	i1) 13.00-13.50		Dry		Very stiff dark bluis [KIMMER DGE CL	h grey CLAY. AY FORMATION	1			12.70	-1.23	
(D34) 14.95-15.00 21/03/2022 3.00 15.00	32) 14.00-14.10									(2.30)		
2//03/2022 3.00	33) 14.50-14.95		Dry								ļ	
										Mate		
From To Type From To Duration Date & Time Depth Strike Time Easted mmai Rise To Central Strike Time Easted results and the Dia. Depth Casing Dia. Depth From To Duration Date & Time Depth Strike Time Easted Rise To Central Searce Hole Dia. Depth Casing Dia. Depth From	m To	Date & T		_	Time Elapsed		aled Hole Dia. Depth	Casing Dia.	Depth		To N	ED /olume (ltr)
0.00     1.20     Inspection Pit     200     15.00     200     3.00       1.20     15.00     Cable Percussion     200     16.00     200     3.00       Remarks       Sorehole terminated on Engineer's Instruction on achieving target depth.       No groundwater encountered.	rks hole terminated		g target de				200 13.00	200	5.00			
No evidence of contamination observed.				11							nination D 15.0 Check	0m

ent	stowe s Englan	d							10052307 Easting (OS mE) 541275.46	11.80 Northing (OS mN) 266548.99	End D	3/2022 <sup>ate</sup> 3/2022	1: Sh	neet 1	of 2
Sa	mples		T	ests		1.04	Progre			Strata			Depth		Inst
Туре	e + Depth	Type + Depth	10.1	Results	5	Water Depth	Date & Time	Casing & Water Depth		Description		Legend	(Thickness)	Level	Bac
(B1)	0.20-0.40	PID (1) 0.20	1	<1ppm			17/03/2022 08:00	0.00 Dry		oft to firm dark brownish grey htly sandy slightly gravelly Cl		$\otimes$			4.0
	S1) 0.20 0.50-0.70	PID (2) 0.50		<1ppm					very angular to subro [MADE GROUND]	ounded fine to coarse flint.				ŧ	1
	S2) 0.50	110 (2) 0.50	11	< ibbii									(1.40)	ŧ	4
(B3)	1.00-1.20	PID (3) 1.00		<1ppm										Ī	1
	S3) 1.00	SPT(C) 1.20	N=	12 (2,4/2,	24.61	Dry			the second					ŧ	1
	1.40-1.70 ) 1.40-1.70		1							wish brown clayey sandy su			1.40	10.40	1
(B5)	1.70-2.00				24				bluish grey silty clay.	coarse GRAVEL of flint rare p	oockets of soft	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(0.70)	ŧ	1
(7)		SPT(C) 2.00		V>50 (8,17		Dry			[RIVER TERRACE I	DEPOSITS			2.40	+	1
(B6)	2.10-2.50 2.10-2.50 ) 2.10-2.50	PID (4) 2.10	60mn	n/38,12 for <1ppm		Y			Very stiff dark bluish brown silty slightly s	grey mottled greyish brown andy CLAY with occasional s	and orangish selenite crystals.	X	2.10	9.70	1
	2.50-3.00					$\nabla$	-		[KIMMER DGE CLA	Y FÓRMATI <u>ON</u>	Siltstone band.			ŧ	1
					11	1						X		Į	1
	3.00-3.50 3.00-3.45	SPT(S) 3.00	N>50	(3,4/8,24, 70mm)		Dry						X	1	ŧ	17
(00)	3.00-3.45			/omm)							Siltstone band.	X		ļ	1
(D10)	) 3.50-4.00										Silisione band.			ŧ	1
					1.1	-								ŧ	17
	) 4.00-4.50 I) 4.00-4.45		UT1	1 52 blows rec.	s 100%	Dry							(3.90)	ŧ	1
			17			1								ŧ	1
	) 4.45-4.55 ) 4.50-5.00													Ŧ	0
														ŧ	1
(B16) (D15)	) 5.00-5.50 ) 5.00-5.45	SPT(S) 5.00	N=	20 (4,4/4,	5,5,6)	Dry					Becoming stiff.			ŧ	
												X-X-		ŧ	1.1
(D17)	) 5.50-6.00											X—		Ŧ	
			10		- 4							X-X-		ŧ	
(ES6)	) 6.00-6.50 ) 6.00-6.50	1	UT18	44 blows	90%rec.	Dry				bluish grey silty CLAY interbe		×	6.00 ·	5.80	
(UT18	3) 6.00-6.45				811	21			siltstone.	weak thickly laminated grey	and light grey	×		ŧ	· • •
(D20)	) 6.50-7.00								[KIMMER DGE CLA	FORMATION		x	1	ŧ	***
									1 1			×		Ŧ	
(B22) (D21)	) 7.00-7.50 ) 7.00-7.45	SPT(S) 7.00	N=	24 (3,5/5,6	6,6,7)	Dry					Becoming stiff.	×		ŧ	
												×		Ŧ	
(D23)	) 7.50-8.00													ŧ	* • •
(000)	0.00.0.50				40004	-								ŧ	· · · ·
(UT24	) 8.00-8.50 1) 8.00-8.45		012	4 62 blows rec.	\$ 100%	Dry						x		Ŧ	
(D25)	) 8.45-8.55											×		ŧ	
	8.50-9.00											x		ŧ	
(829)	9.00-9.50	SPT(S) 9.00	N=	21 (3,5/5,4	4.5.7)	Dry								ŧ	
(D28)	9.00-9.45	in the same			4-414							X		ŧ	1.2
(D30)	9.50-10.00											×		Į	
														ţ	
(833) 1	10.00-10.50		UT3	1 70 blows	s 100%	Dry			1			X		ŧ	. 4
<del>UT31)</del>	DR LLING	TECHNIQUE			HISELL	NG		-	WATER OBSERVATIO		E/CASING DIAME	TER	WATE	RADD	ED
From	To 120	Type Inspection Pit		From 2.10	Strata To 2.30	Duration	Date & Ti		Tunnet	e To Depth Depth Sesied Hole Dia.	Depth Casing Dia. 15.45 200	Depth 2.30	From	To	/olume
1.20	15.45	Cable Percussion		3.30 12.20	3.40 12.50	00:40 00:25 01:00	100000				150	2.30 4.65			
oundy	terminated o	on Engineer's Ins ge observed at 2 amination observ	50m.	n on ach	ieving ta	arget dep	th.							ination D	José
													lem	15.4	
_			_	_			Equipme						ged By	Check	

Project Norths Client Homes	towe Englan	d					Project No. 10052307 Easting (OS mE) 541275.46	Ground Level (n 11.80 Northing (OS m) 266548.99	N)	End D	3/2022		ale 50 neet 2	of 2
	ples		Tests		Progr	ess		Stra	ta			1.20		10-00
Type +	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	1	Description			Legend	Depth (Thickness	Level	Install Backfi
(834) 10	0.45-10.55 0.50-11.00			Coput		Depth	Firm becoming stif extremely weak ar siltstone. [KIMMER DGE CL	f bluish grey silty Cl d weak thickly lami AY FORMATION]	AY interbedded v hated grey and lig	rith ht grey				
(D36) 11	1.50-12.00 1.50-11.95 2.00-12.50	SPT(S) 11.50	N=28 (4,5/5,7,7,9)	Dry										
	2.50-13.00							=	Siltsto	ne band.		(9.45)		
- (B41) 13 (UT40) 1	3.00-13.50 3.00-13.45		UT40 110 blows 100% rec.	Dry									ļ	
	3.50-14.00													
	4.00-14.50										x 		Ī	
	4.50-15.00 5.00-15.45	SPT(S) 15.00	N=32 (4,6/6,8,8,10)	Dry					Becoming				I	
					17/03/2022 17:00	4.65 Dry					x x	15.45	-3.65	
	OR LLING	TECHNIQUE	CHISEL				WATER OBSERVATI		HOLE/CASI		TER	WATE	RADD	
From 0.00 1.20	To 1.20 15.45	Type Inspection Pit Cable Percussion	Hard Strata From To 2.10 2.30 3.30 3.40	Duration 00:40 00:25				Rise To Depth Casing Sesied	Hole Dia. Depth 200 15.45	Casing Dia. 200 150	Depth 2.30 4.65	From	То	Volume (ltr
1.20 Remarks Trial pit te Groundwa	erminated c ater seepa	Cable Percussion	truction on achieving 50m. red.	0 01:00	5					150		Term	nination [ 15.4	

orthstowe ent omes England	d					Easting (OS mE) Northing (OS mN) End E	)3/2022 ate )3/2022		50 neet 1 d	of 2
Samples	_	Tests		Progre	ess	Strata		100.		
Type + Depth	Type + Depth	Results	Water	Date & Time	Casing & Water	Description	Legend	Depth (Thickness)	Level	Inst Bac
(87) 0.10-0.30	PID (1) 0.10	<1ppm	Depth	21/03/2022	Depth 0.00	MADE GROUND: Soft dark greyish brown slightly sandy gravelly	XXXX	1		1.
(ES1) 0.10-0.20				15:50	Dry	CLAY with occasional organic material. Gravel is angular to subrounded fine to coarse of brick and flint.		(0.35)	10.05	2
(B8) 0.50-0.70	PID (2) 0.50	<1ppm			1.11	MADE GROUND] MADE GROUND: Stiff brown slightly sandy gravelly CLAY.	/	0.35 (0.35)	10.95	1.
(ES2) 0.50-0.60						Gravel is fine to coarse, subangular to subrounded of brick and		0.70	10.60	5
(89) 1.00-1.20						flint. [MADE GROUND]	/		E E	2
(ES3) 1.00-1.10 (B10) 1.20-1.65	SPT(S) 1.20	N=9 (1,2/2,2,2,3)	Dry	21/03/2022	0.00	Firm light grey slightly sandy slightly gravelly CLAY with occasional orange sand and gravel pockets up to 15mm. Gravel	HEET		Ŧ	1
(D17) 1.20-1.65	PID (3) 1.20	<1ppm		17:00 22/03/2022	Dry 0.00	is subangular to subrounded fine to coarse of siltstone. [KIMMER DGE CLAY FORMATION]			‡ (	1
1 C C C C				00:80	Dry		E==:		t k	2
1. C. T.							1-1-1	(2.30)	Ŧ	
(B35) 2.00-2.50 (ES4) 2.00-2.10	PID (4) 2.00	<1ppm					E-2-		Ŧľ	1
(201) 2.00 2.10									‡	2
							E-27	1.21	‡ [	1
									Ŧ	3
(B11) 3.00-3.50	SPT(S) 3.00	N>50 (25 for 25mm/50	Dry					3.00	8.30	2
(D18) 3.00-3.13 (ES5) 3.00-3.10	PID (5) 3.00	for 70mm) <1ppm	Diy			Very stiff dark bluish grey slightly silty CLAY with occasional coarse subangular gravel of siltstone.	x_x-	5.00	1	2
(200) 3.00-5.10		- ippin	1.1			[KIMMER DGE CLAY FORMATION] Siltstone band.		(0.90)	‡	1
		1.00						(0.50)	ŧ	1
		A. 1997	<b>.</b>					3.90	7.40	2
(UT31) 4.00-4.45	PID (6) 4.00	<1ppm UT31 41 blows 100%	Dry			Stiff to very stiff dark bluish grey CLAY. [KIMMER DGE CLAY FORMATION]		3.50		4
10 M		rec.	100			Rare shell fragments.			ŧ.,	
(D19) 4.45-4.50									ŧ	
1.15									I	
(B12) 5.00-5.50	SPT(S) 5.00	N=19 (3,4/4,5,5,5)	Dry				E		1	
(ES6) 5.00-5.10	PID (7) 5.00	<1ppm					F2-2	0.18	-	*
									i i	
		1.6					F2-2	3	Ī	-
									‡	
(UT32) 6.00-6.45		UT32 31 blows 100% rec.	Dry				523		Ŧ	-
		1000							Ī	
(D20) 6.45-6.50							5-2-3		‡	· • • •
							2-2-		ŧ :	
(B13) 7.00-7.50 (D21) 7.00-7.45	SPT(S) 7.00	N=17 (3,4/4,4,4,5)	Dry					(11.10)	ŧ	-
(021)1.00-1.40							EEE		‡ .	
1 1		1.					644		‡ :	
							ERR		Į .	4
(UT33) 8.00-8.45		UT33 43 blows 90%rec.	Dry				E		± :	
		The second second	av				5-5-		ŧ.	ે
(D22) 8.45-8.50									İ.	-
							1		ŧ	
(D44) 5 55 5 5 5	007/01/0 007	N-10 /2 /// / 5 /2	Deci						ŧĿ	
(B14) 9.00-9.50 (D23) 9.00-9.45	SPT(S) 9.00	N=18 (3,4/4,4,5,5)	Dry				E		Ŧ	
									ŧĿ	
							E		Ē	
-									ŧ	
UT34) 10.00-10.45		UT34 49 blows 100% rec.	Dry						†	Ì
DR LLING T	TECHNIQUE Type	CHISELL Hard Strata	NG	n Date & Ti	_	VATER OBSERVATIONS HOLE/CASING DIAM pth Strike Time Experts Rise To Central Speets Post Hole Dia. Depth Casing Dia.	Depth			D
0.00 1.20 1.20 15.00	Inspection Pit Cable Percussion	From To	Duratio	22/03/2022		put strike         (mina)         rose to         Casing         seled         note bia.         Deput         Casing bia.           12.70         20         12.55         200         2.50         200	2.50	TIM	10 10	in the
			=		9					
		truction on achieving t	arget dep	th.						
oundwater seepag evidence of conta								-		-
								Term	ination De 15.00	

Project Northstow Client Homes En							Project No. <b>10052307</b> Easting (OS mE) <b>541432.52</b>	Ground Level (r 11.30 Northing (OS m 266457.44	nAOD) N)	Start 0 21/0 End D 22/0	Date 3/2022 ate 3/2022		<sup>ale</sup> 50 neet 2	of 2
Samples			Tests		Progr		-	Stra				Depth		Install/
Type + Dep	pth Typ	e + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	And the second s	Description			Legend	(Thickness)	Level	Backfil
(D24) 10.45- (D24) 10.45- (D25) 11.00-							Stiff to very stiff da [KIMMER DGE CL	rk bluish grey CLA) AY FORMATION]	£.					
- (B15) 11.50- (D26) 11.50-	-12.00 SP -11.95	T(S) 11.50	N=18 (4,5/5,5,2,6)	Dry									ļ	
- (D27) 12.00-	-12.10			×										
— (B16) 13.00-	-13.50 SP	T(C) 13.00	N=38 (4,7/7,7,11,13)	Dry					Siltston	e bands.				
- (D28) 14.00-	-14.10												ļ	
- (UT35) 14.50	-14.95		UT35 53 blows 100% rec.	Dry							Ē		ŧ	Ē
_ (D29) 14.95-	-15.00				22/03/2022 13:00	2.50 Dry						15.00	-3.70	
													Ŧ	124
	LLING TECH		CHISELI Hard Strata	_					HOLE/CASI				RADD	
	To 20 1.00 Ca	Type Inspection Pit able Percussion	From To	Duratio	on Date & 1 22/03/2022		epui ouike (mins)	Rise To Depth Depth Casing Sealed	Hole Dia. Depth 200 2.50 150 15.00	Casing Dia. 200	Depth 2.50	From	То	Volume (ltr)
Remarks Trial pit termir Groundwater No evidence o	seepage ob	served at 1.		arget dep	pth.							Tern	nination [ 15.0	
AGS	Dep	ess otherw th (m), Dia kness (m),	ise stated meter (mm), Time (h , Level (mOD).	hmm),	Equipme Dando		S				Lo Ti	ogged By L	Check CPr	ed By

orthsto ent omes E	owe Englan	d					Project No. 10052307 Easting (OS mE) 541402.37	Ground Level (n 11.60 Northing (OS m 266402.29	N)	End D	)3/2022 late )3/2022	1: Sł	<sup>ale</sup> 50 neet 1	of 2
Samp	les		Tests		Progre	ess	1	Stra	ata			1250		
Type + D	Depth	Type + Depth	Results	Water	Date & Time	Casing & Water	The second second	Description			Legend	Depth (Thickness)	Level	Inst Bac
(B1) 0.10	0-0.30	PID (1) 0.10	<1ppm	Depth	22/03/2022	Depth 0.00	MADE GROUND: F	irm orangish brow	n and brown :	sandy gravelly	1.00			4.
(ES2) 0.1	0-0.20				14:30	Dry	CLAY Gravel is and and chert.					(0.30) 0.30	11.30	1
(B3) 0.50	0-1.00	PID (2) 0.50	<1ppm			11	[MADE GROUND]	d and the barriers	r		/k_``_x		<b>‡</b>	1
(ES4) 0.5	50-0.60						Yellowish brown an SAND Gravel is an				$X \times X$		‡	*
							is fine to coarse. [RIVER TERRACE	DEPOSITSI			$\mathbf{x} \in \mathbf{x}$		Ŧ	
(B6) 1.20	0-1 65	SPT(S) 1.20	N=8 (2,3/2,2,2,2)	Dry			1.1				XXX		Ŧ	
(D5) 1.20 (ES7) 1.2	0-1.65	PID (3) 1.20	<1ppm	2.9							XXX		ţ	
(201) 12											XXXX		1	
											XXX		<b>†</b>	1.0
(89) 2.00		SPT(S) 2.00	N=16 (3,4/3,4,4,5)	Dry				-	Becoming m	edium dense.	Txxx	(3.40)	<u>†</u>	
(D8) 2.00 (ES10) 2.0								lo	cally clayey gr				Ī	-
											× ×		Į.	
											XXX		‡	
				-							X: X		<b>‡</b>	
(B12) 3.0 (D11) 3.0	0-3.45	SPT(S) 3.00	N=15 (3,3/3,4,4,4)	Dry									Ŧ	
(ES13) 3.0	00-3.10										XXX		I	***
				$\nabla$							XXXX		1	
(B14): (ES15) 3.1	3.70 70-3.80	PID (4) 3.70	<1ppm				Medium dense dar					3.70 (0.20) 3.90	7.90	
(B16) 4.0		SPT(C) 4.00	N=21 (4,5/5,5,4,7)	3.20	22/03/2022 17:15	3.00 3	Gravel is subangula	DEPOSITS]		· · · · · · · · · · · · · · · · · · ·	A.X.X	3.90	- 7.70	
(ES17) 4.	00-4.10	PID (5) 4.00	<1ppm		23/03/2022 07:30	3.00 3	Medium dense yello subrounded fine to	owish brown silty s coarse GRAVEL of	andy angular f flint with few	to rounded	x. X. X		Ŧ	
						1.1	cobbles. [RIVER TERRACE				X X X	(1.00)	1	
							INVER IERRAGE	DEPOSITS			X.X.X		ŧ .	v
		Same					Firm bluish grey silt	V CLAY with extrem	mely weak an	d vorv woak	1 (*X)	4.90	6.70	
(B19) 5.0 (D18) 5.0	0-5.45	SPT(S) 5.00 PID (6) 5.00	N=8 (2,3/2,2,2,2) <1ppm	4.90			light grey and grey	siltstone. bands.	nely weak an	u very weak	x		Ŧ	14
(ES22) 5.0	00-5.10						[KIMMER DGE CL/	AY FORMATION]			x		Ē	11
											x		ŧ	11
				1							x_X_		ŧ.	11
(UT20) 6.0	00-6.45		UT20 32 blows 100%	Dry							x		<b>‡</b>	24
			rec.										Ŧ	13
(D21) 6.4	5-6.50												Ŧ	11
											<u></u>		ŧ	59
											×		‡ i	11
(B24) 7.0 (D23) 7.0	0-7.50	SPT(S) 7.00	N>50 (2,3/4,4,4,5 for Omm)	Dry				2	Becon	ning very stiff.	- <u>x</u>		<b>†</b>	14
											×		Ŧ	19
											x	(10.10)	Ŧ	11
											×		-	11
(UT25) 8.0	00-8.45		UT25 46 blows 100%	Dry							x		<b>‡</b>	1
			rec.								x		ŧ	24
(D26) 8.4	5-8.50										x		£	11
											x		ţ.	11
inerest in the											× <u>×</u> –		ŧ	11
(B28) 9.0 (D27) 9.0		SPT(S) 9.00	N=16 (3,4/4,4,4,4)	Dry					В	ecoming stiff.	x		Ŧ	1
											×		Ī	11
											x_X-		ŧ	14
											-X-		ŧ	1
(UT29) 10.(	00-10.45		UT29 47 blows 100%	Dry		111.	1				- <u>x</u> -		ŧ	22
DF	RLLING	TECHNIQUE	rec. CHISEL	LNG			WATER OBSERVATIO	ONS	HOLE/C	ASING DIAM	TER	WATE	RADD	ED
From 0.00	To 120	Type Inspection Pit	Hard Strata From To	Duratio	n Date & Ti 22/03/2022			se To Depth Depth Casing Sealed	Tiole Dia. De	pth Casing Dia.	Depth 3.00	From	To V	/olume
1.20	15.00	Cable Percussion		1 1	23/03/2022	11 00		2.75 5.00	100 10	200	3.00			
marks al pit tern	minated o	n Engineer's Inst	ruction on achieving	target dep	oth.	_				1			- 0	_
oundwate	er seepag	ges observed at 3 amination observ	3.70m and 13.10m.									Term	nination D	epth:
													15.00	

	d					541402.37	2	orthing (OS mN 66402.29		23/0	03/2022	Sh	neet 2	of 2
Samples		Tests		Progr	ess			Strat	а					Inete
Type + Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth			Description			Legend	Depth (Thickness)	Level	Insta Back
			Dopui		Deptri	Firm bluish grey light grey and gre	silty CLA	Y with extrem	ely weak and v	ery weak	×_^	2	+	(7)
(D30) 10.45-10.50						[KIMMER DGE (	SLAY FOI	RMATION]			×	2	I	//
											×	2	ļ	
(D21) 11 00 11 10											×	2	ŧ	
(D31) 11.00-11.10											×		F	
											×	2	ļ	
(D32) 11.50-11.95	SPT(S) 11.50	N=18 (3,4/4,4,5,5)	Dry								×		Ī	
											×_×_		-	
(D33) 12.00-12.10											×_×_		Ē	
											×_×_	-	ļ	1
											×		+	
											×		Į	
(B34) 13.00-13.50	SPT(C) 13.00	N=32 (4,6/7,7,8,10)	<b>V</b> ry					Freque	Becoming nt bands of gre	g very stiff.			†	
								110400	The ballus of gro	y sitistorio.			Į	
													ţ	
													Į	
(D35) 14.00-14.10											×	-	÷	//
											×		I	
(UT36) 14.50-14.95		UT36 53 blows 100% rec.	12.80								11×— —	-	ţ	
/=													ţ	
(D37) 14.95-15.00				23/03/2022 13:00							<u></u>	15.00 -	-3.40	<u> </u>
													İ	
													ţ	
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DR LLING 7	TECHNIQUE	CHISELL	NG	1	Ι,	WATER OBSERVA	TIONS		HOLE/CAS	ING DIAM	ETER	U WATE	RADD	ED
From To 0.00 1.20	Туре	Hard Strata From To	Duratio	n Date & 1	īme De	epth Strike Time Elapsed (mins)		Depth Depth Casing Sealed 3.00	Hole Dia. Depth 150 15.00	Casing Dia.	Depth 3.00			Volume
1.20 1.20 1.20 15.00	Inspection Pit Cable Percussion			23/03/2022	11 00	3.70 20 13.10 20	3.30 12.75	5.00	150 15.00	200	3.00			
emarks														
ial pit terminated or		ruction on achieving t 3.70m and 13.10m.	arget dep	oth.										
o evidence of conta	amination observ	ed.										Torm	ination D	)enth:
												lerm	15.00	
														ked By

orthstow ent omes En						Easting (OS mE) Northing (OS mN) Er	6/03/2022 nd Date 6/03/2022		25 heet 1	of
SAMPLE	-		TEST	S	ĻΩ	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	Ins Bao
0.00 - 0.40 0.00 - 0.40	B1 D1	-				MADE GROUND: Light orangish brown slightly clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse of brick and flint. [MADE GROUND]		(0.40)		
0.40 - 1.60 0.40 - 1.60 0.40 - 1.60 0.40 - 1.60	B2 D2 ES1 ES2	0.40	PID	<1ppm		MADE GROUND: Stiff light grey slightly sandy CLAY with rare sand pockets up to 30mm and low cobble content. Cobbles are angular to subangular of brick. [MADE GROUND]		0.40	13.12	
	-							(1.20) -	+ + + + + + + + + + + + + +	
1.60 - 3.00 1.60 - 3.00 1.60 - 3.00	B3 D3 ES3	- 1.60 	PID	<1ppm		Stiff dark bluish grey slightly gravelly CLAY with occasional siltstone bands up to 100mm thick. Gravel is angular fine to coarse of siltstone. [KIMMERIDGE CLAY FORMATION]		1.60		
				(1.40)						
	-	- 	PID	<1ppm				3.00 -	t	
AN DETAIL	s	-				Remarks				
_ <b>⊢</b>		3.0		Long Axi	s Orientat		ng target de	pth.		
5				Stability:		None sription): Not encountered.		Term	ination	Dep

oject orthstow ent omes En						Project No.         Ground Level (mAOD)           10052307         11.46           Easting (OS mE)         Northing (OS mN)           541341.61         266580.53	Start Date 17/03/2022 End Date 17/03/2022	! 1:	<sup>ale</sup> 25 heet 1	of '
SAMPLE	S		TEST	S	er es	STRATA				Γ.
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	Ins Bac
0.00 - 0.20 0.00 - 0.20	B1 D5	-				MADE GROUND: Light brown clayey gravelly SAND with rootlets. Gravel i angular fine to medium of brick and flint.	s 🔀	(0.20)	1	
0.00 - 0.50 0.20 - 0.50 0.20 - 0.50	ES9 B2 ES10	0.20	PID	<1ppm		[MÅDE GROUND] MADE GROUND: Firm light yellowish brown sandy gravelly CLAY. Gravel	is XX	0.20	11.26	; <b>∭</b> ≣
0.20 - 0.50	ESIU	-				angular to subangular fine to coarse of flint, brick, limestone. [MADE GROUND]		(0.30)	ļ	
0.50 - 1.40	D6	- - - 0.50	PID	<1ppm				0.50	İ 10.06	≡    =
0.50 - 1.40 0.50 - 1.40	D7 ES11	-				Firm light grey silty CLAY with silt pockets and fine sand pockets with rootl [KIMMERIDGE CLAY FORMATION]	ets. <u> ^</u>		ŧ	Ë
0.50 - 1.50	В3	-							Į	
		-					×		t	
		-					×	(0.90)	ļ.	
		-							ł	
		-							ļ	
.40 - 3.00 .40 - 3.00	4 D8	1.40	PID	<1ppm		Stiff dark bluish grey silty CLAY with frequent pockets of silt and sand and	with ×	1.40	10.06	
.40 - 3.00	ES12	-				rootlets. [KIMMERIDGE CLAY FORMATION]			ł	
		-							ļ	
		-					×		t	
		-					×_*_		ł	
		-					×	-	Г	
		-						(1.60)	ļ	
		-					×		ł	
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		-							ł	
		-					× 		ł	
		-							ļ	
		- - 3.00	PID	<1ppm			<u> </u>	3.00 -	8.46	; 
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AN DETAIL	.S			1	1	Remarks	I		1	<u>.                                    </u>
		3.0		Long Axi	s Orientat	No groundwater encountered.	achieving target de	pth.		
					(	0.00 No evidence of contamination observed.				
5					Support:					
				0 50m.		between ground level and		Torm	ination	Den
$\perp$				Groundw	ater (deso	ription): 0.5m seepage.			3.00r	
									0.001	

### TP2C104

Project Northstow Client Homes En						Project 1 10052 Easting 5412	2 <b>307</b> (OS mE)	Ground Level (mAOD) 12.13 Northing (OS mN) 266547.04	Start Date 16/03/202 End Date 16/03/202	2 1:	<sup>ale</sup> 25 heet 1 of 1
SAMPLE	ES		TEST	S	۲ű			STRATA			
Depth	Type/	Depth	Type/ No.	Results	Water Strikes		Desc	ription	Legend	Depth (Thickness)	Level Back
0.00 - 0.20 0.00 - 0.20 0.00 - 0.20 0.20 - 0.50 0.20 - 0.50 0.20 - 0.50	No. B1 D1 ES1 B2 D2 ES2	- 0.20	PID	<1ppm		subangular coarse of brick [MADE GROUND] MADE GROUND: Soft ora	k and concrete	LAY. Gravel is fine to angular to ravelly CLAY. Gravel is angular to oncrete and with fragments of plast	ic and	(0.20) 0.20 (0.30)	
- - - 0.50 - 1.50 - 0.50 - 1.50 - 0.50 - 1.50 - - -	B3 D3 ES3	- - 0.50 - - - -	PID	<1ppm		[MADE GROUND]	e.	CLAY. Gravel is subangular to rou	nded	0.50	
- - - - - - - -		- 								(1.00) -	
- - 1.50 - 3.00 - 1.50 - 3.00 - 1.50 - 3.00 - - - - - -	B4 D4 ES4	- - 1.50 - - - - -	PID	<1ppm		Firm becoming very stiff li bands. [KIMMERIDGE CLAY FO		y silty CLAY with occasional claysto	ne	1.50 ·	
- - - - - - - -		- - - - - - - -								(1.50)	
- 		- 									
		- 3.00	PID	<1ppm						- 3.00 -	
	_S	3.0		Long Axis Shoring / Stability: 3	( Support:	0.00	No groundwa	nated on Engineer's Instruction on a ter encountered. of contamination observed.	achieving target de	epth.	, I
						cription): Not encountered.					ination Depth 3.00m



Logged By Checked By
TL CPr

### **TP2C105**

	Type/ No. 50 B1 50 D4					Easting 5413	(OS mE) 13.25	Northing (OS mN) 266549.91	End Date 17/03/202	2 S	:25 heet 1	of
SAMPLES	S		TEST	5	ter (es			STRATA		Depth		Ins
Depth		Depth		Results	Water Strikes		Desci	iption	Legend	(Thickness)	Level	Ba
.00 - 0.50 .00 - 0.50	D4					Very soft brownish grey sa [POSS BLE RIVER TERF	andy gravelly C RACE DEPOSIT	_AY with rootlets. S]		-	ļ	
0.00 - 0.50	ES7					-				(0.50)	ŧ	
										(0.50)	ł	
										*	t	
.50 - 1.40 .50 - 1.40	B2 D5	- 0.50	PID	<1ppm		Soft to firm light brownish [POSS BLE RIVER TERF		AY with pockets of organic rich o		0.50	+ 10.90	<u>ا</u>
.50 - 1.40	ES8							0]		-	Į	
	-									- -	ţ	
	-									(0.90)	Ì	
										(0.90)	÷	
	-									-	t	
										-	ł	
40 - 3.00	В3	1.40	PID	<1ppm						1.40	10.00	
40 - 3.00 40 - 3.00	D6 ES9	-				sand.	-	casional silt pockets and pocke	IX		+	
						[KIMMERIDGE CLAY FO	RMATION]		×_ <u>×</u> _		I	
	-								×_ <u>×</u> _		ļ	
	-								×_ <u>×</u> _		ŧ	
									×_ <u>×</u> _	-	l	1111
	-								×_ <u>×</u> _		ļ	
									×_ <u>×</u> _	(1.60)	ŧ	
											1	
	-								×		t	
		-							×_ <u>×</u> _	2	Ī	
	-								×_ <u>×</u> _	2	ļ	
	-								×_ <u>×</u> _		ŧ	
		•							×	2	I	
	-	— 3.00	PID	<1ppm						3.00 -	8.40	, ma
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	F										+	
	 S						Remarks		I			
		3.0		Long Axis	Orientat	ion:	Trial pit termin	ated on Engineer's Instruction o	n achieving target de	epth.		
Т						0.00		er encountered. f contamination observed.				
				Shoring / Stability:	Support: Unstable	None between ground level and						
				1.40m		cription): Not encountered.				Term	nination	Dep
1.1					(200)	, ,					3.00n	
							1			1	0.001	
						Equipment Used				ogged By	Checke	

roject Iorthstow lient Iomes Eng						10052307 11.28 1 Easting (OS mE) Northing (OS mN) Er	art Date 7/03/2022 nd Date 7/03/2022	2 1:	:25 heet 1	of 1
SAMPLE	S		TEST	S	ب v	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	Inst Bac
0.00 - 0.20 0.00 - 0.20 0.00 - 0.20 0.20 - 1.10 0.20 - 1.10 0.20 - 1.10	B1 D4 ES7 B2 D5 ES8	0.00	PID	<1ppm <1ppm		Soft light yellowish brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of claystone and flint. [POSS BLE RIVER TERRACE DEPOSITS] Firm light yellowish grey silty CLAY with local pockets of orangish brown sand and with rootlets. [RIVER TERRACE DEPOSITS]		(0.20) 0.20	11.08	
	-	- - - - -						(0.90)	*	
1.10 - 3.00 1.10 - 3.00 1.10 - 3.00	B3 D6 ES9	 1.10	PID	<1ppm		Stiff dark bluish grey silty CLAY with rootlets, silt pockets and small pockets of orangish brown sand. [KIMMERIDGE CLAY FORMATION]		1.10	10.18	
	-	- - - - - - - -						(1.90)	+	
					(1.30)	+ + + + + + + + + + + + + + + + + + + +				
		- - -					×	3.00 -	8.28	
AN DETAIL	s	-				Remarks			T	
		3.0		Shoring / Stability:	Support: Unstable	Trial pit terminated on Engineer's Instruction on achievi Groundwater seepage observed at 0.90m.           0.00         No evidence of contamination observed.	ng target de		nination	Dept
			vise stated		(	Equipment Used		gged By	3.00r	n

orthstow ont omes En						Easting (OS mE) Northing (OS mN) E	7/03/2022 Ind Date 7/03/2022		:25 heet 1	of
SAMPLE	<u> </u>		TEST	S		STRATA				Т
Depth	Type/	Depth	Type/	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	Ins Bao
0.00 - 0.20 0.00 - 0.20 0.00 - 0.20 0.00 - 0.20 0.20 - 0.70 0.20 - 0.70	No. B1 D5 ES9 B2 D6	0.00	No. PID PID	<1ppm <1ppm		MADE GROUND: Firm dark brown gravelly CLAY. Gravel is angular to subrounded fine to coarse of brick and flint. [MADE GROUND] Firm bluish grey mottled orange sandy gravelly CLAY with occasional silt pockets and rootlets Gravel is subangular subrounded fine to medium of siltstone.		(0.20) 0.20	11.27	
0.20 - 0.70	ES10	- - - - -				[KIMMERIDGE CLAY FORMATION]		(0.50)	- - - - -	
0.70 - 1.70 0.70 - 1.70 0.70 - 1.70	B3 D7 ES11	- 0.70 	PID	<1ppm		Firm to stiff light bluish grey sandy CLAY with occasional pockets of orangish brown sand. [KIMMERIDGE CLAY FORMATION]		0.70	10.77	
		-			-			(1.00)	-	
.70 - 3.00 .70 - 3.00 .70 - 3.00	B4 D8 ES12	- - - - - - -	PID	<1ppm		Stiff dark bluish grey silty CLAY with rootlets and silt pockets [KIMMERIDGE CLAY FORMATION]	×	1.70	9.77	
		- 					<pre></pre>		+ + + + + + + + + + + + + + + + + + + +	
				(1.30)	+ + + + + + + + + + + + + + + + + + + +					
		- - - - - -						3.00 -	8.47	
		- - - - - -								
		-							*	
		- - - -							-	
		- - - - -							+ + + + + + + + + + + + + + + + + + + +	
N DETAIL	s	- - - -				Remarks		-	1 	
		3.0				on:         Trial pit terminated on Engineer's Instruction on achiev Groundwater seepage observed at 1.50m.           0.00         No evidence of contamination observed.	ing target de	pth.		
				Stability:		None between 0.40 to 1.70m ription): 1.5m seepage.		Term	nination 3.00r	



orthstow ont omes Eng						Project 1 1005 Easting 54134		Ground Level (mAOD) 11.29 Northing (OS mN) 266519.23	Start Date 17/03/2022 End Date 17/03/2022	2 1:	ale 25 heet 1	of
SAMPLE	S		TEST	3	er es			STRATA		Depth		Ins
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes		Des	cription	Legend	(Thickness)	Level	Ва
.00 - 0.50 .00 - 0.50	B1 D4	0.00	PID	<1ppm		is angular to subangular f	llowish brown ine to medium	sandy gravelly CLAY with rootlets to coarse of brick.	. Gravel			
.00 - 0.50	ES7					[MADE GROUND]				(0.50)		≝
	Ē									(0.50)	ļ	≝
50 4 00	-	0.50	DID							0.50	ł	1111 :
.50 - 1.90 .50 - 1.90 .50 - 1.90	B2 - D5 - ES8 -	- 0.50	PID	<1ppm		Firm light grey sandy CLA [KIMMERIDGE CLAY FO	Y with rootlets	and occasional small sand pock	ets.	0.50	10.79	
	-											
	Ē										ł	
	-											
	F										ł	
	-									(1.40)	1	
	-										Į	
	-										Į	
	-	-									Ī	
	-										ł	
	-										9.39	
90 - 3.00 90 - 3.00	B3 D6	1.90	PID	<1ppm		Firm to Stiff bluish grey si [KIMMERIDGE CLAY FO		rootlets and occasional silt pockets		1.90	9.39	
90 - 3.00	ES9					[KIMMERIDGE CLAT FO	RIVIATION		×	-	ļ	
	-								×		ł	
	-								×		l	
	-									(1.10)	ŧ	
	-	-							×		ļ	
	-								×		-	
									×		ł	
	-								×		8.29	
	-									3.00 -	- 0.29	
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	E									-	Į.	
	F						Remarks					L
	-	3.0		Long Axi	s Orientat	ion:	Trial pit termi	nated on Engineer's Instruction or	n achieving target de	pth.		
Т						0.00		ater encountered. of contamination observed.				
				Shoring / Stability:		None						
						cription): Not encountered.				Term	ination I	Dep
											3.00n	n
_						Equipment Used	1			gged By	Checke	d P
I S		less other		: n), Time (hhmm)					LU	3954 Dy	2.10010	



omes En	gland					54137	70.89 266	ng (OS mN) 520.61	17/03/2022	2 S	heet 1	of 1
SAMPLE	s		TEST	S	er		STRATA	<u>.</u>		Donth		Inst
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes		Description		Legend	Depth (Thickness)	Level	Bac
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.10 - 1.10 0.10 - 1.10 0.10 - 1.10	B1 D4 ES7 B2 D5 ES8	0.00	PID PID	<1ppm <1ppm		MADE GROUND: Soft ora rootlets. Gravel is angular [MADE GROUND] Firm light yellowish grey s subangular to subroundec [POSS BLE RIVER TERR	r to subangular fine to co sandy gravelly CLAY with d fine and medium of silt	arse of brick, flint, and ceran	nic.	(0.10) 0.10	10.50	
		· - - - - - - - -								(1.00)		
1.10 - 3.00 1.10 - 3.00 1.10 - 3.00	B3 - D6 - ES9 -	1.10	PID	<1ppm		Stiff dark bluish grey silty [KIMMERIDGE CLAY FOI		nd rootlets.		1.10	9.50	
										(1.90)	t	
										3.00 -	7.60	
	S	3.0		Long Axis		ion: 0.00	Remarks Trial pit terminated on I No groundwater encou No evidence of contam		ieving target de	pth.		
5				Shoring / Stability: Groundw	Support: Stable					Term	nination 3.00r	

### **TP2C113**

orthstow <sup>ent</sup> omes En						Easting (OS mE) Northing (OS mN) 541311.01 266487.68	End Date 17/03/2022	s s	heet 1	of
SAMPLE	S		TEST	S	er es	STRATA				
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	Ins Bao
0.20	ES1	- 0.20	PID	<1ppm		MADE GROUND: Soft to firm mottled brown and dark brown silty gravelly CLAY with rare cobble size pockets of organic clay. Gravel is subangular to subrounder fine to coarse flint and rare brick fragments. [MADE GROUND]	d	(0.90)		
0.50	ES2	- 0.50 - - - - -	PID	<1ppm				0.90		
1.00	ES3	- - 1.00 - -	PID	<1ppm		Orangish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint and chert. [RIVER TERRACE DEPOSITS]		(0.50)	+	
1.20	B1	-				Firm to stiff light greenish grey becoming dark greenish grey silty CLAY with	×	1.40	ł	
1.70	ES4	1.70	PID	<1ppm		occasional pockets of orangish brown silty clay and occasional decaying rootlets [KIMMERIDGE CLAY FORMATION]				
2.50 2.50	B2 D2	- - - - - - - - - - - - - - - - - - -						(1.60)		
		- - - - - - - - - - - - - - - - - - -						3.00 -	7.18	
		- - - - - - - - - - -								
		-								
AN DETAIL	S	-				Remarks			<u> </u>	
		3.0		Long Axis			ving target de	pth.		
				Shoring / Stability: 3 1.40m Groundwa	Sidewall i	nstability between 0.90 and		Term	nination [	
									3.00n	n

orthstow orthstow omes En						Project I 10052 Easting 54130		Ground Level (mAOD) 10.99 Northing (OS mN) 266489.53	17/03/202 End Date 17/03/202	2 1:	:25 heet 1	of ′
SAMPLE	-		TEST	S			ç	TRATA				T
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes		Descrip		Legend	Depth (Thickness)	Level	Ins Bac
).00 - 0.30 ).00 - 0.30	B1 D2	0.00	PID	<1ppm		Soft bluish dark grey silty [KIMMERIDGE CLAY FO	CLAY with some	silt pockets and rootlets.	×		+	
0.00 - 0.30	ES3						RMATION		×_×_	(0.30)	Į	
).30 - 1.30 ).30 - 1.30	B4 D5	0.30	PID	<1ppm				sand pockets and pockets o		0.30	10.69	, <b>E</b>
0.30 - 1.30	ES6					clayey gravel. Gravel is a [KIMMERIDGE CLAY FO	ngular to subrour RMATION]	ided fine to coarse of claysto	ne. <u>x</u>		ł	
	-								× ××_		ł	
											ļ	
	Ē								<u>×_</u>	(1.00)	ţ	
	-								    	-	÷	
	F								×_×_		Į	
.30 - 3.00	В7	1.30	PID	<1ppm			0.4%			1.30	9.69	
1.30 - 3.00 1.30 - 3.00	D8 ES9					Stiff bluish dark grey silty [KIMMERIDGE CLAY FO	CLAY. RMATION]		×		ł	
	-	-									ŧ	
									× ××		ļ	
											ţ	
	-								×_ <u>×</u> _		ŧ	
											Ţ	
									×_ <u>×</u> _	(1.70)	ļ	
									× ×		ţ	
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									<u></u>		ŧ	
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AN DETAIL	s						Remarks					
		3.0		Long Axi	s Orientat	ion:	Trial pit termina No groundwater	ted on Engineer's Instruction	on achieving target de	epth.		
T						0.00		contamination observed.				
				Shoring /	Support:	None						
6				Stability:						· -	ainct	<u>D-</u>
				Groundw	ater (deso	cription): Not encountered.				lerm	nination 3.00r	
<u> </u>											0.001	

nt mes En						Easting	2307 (OS mE) 04.64	10.79 Northing (OS mN) 266490.03	17/03/202 End Date 17/03/202		:25 heet 1 of
SAMPLE	S		TEST	S	er es			STRATA			I .
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes		Descr	ption	Legend	Depth (Thickness)	Level Ba
.00 - 0.30 .00 - 0.30 .00 - 0.30	B1 D2 ES3	0.00	PID	<1ppm		MADE GROUND: Very so [MADE GROUND]	oft yellowish ligh	brown sandy gravelly CLAY.		× × × (0.30)	
30 - 1.40 30 - 1.40 30 - 1.40	B4 - D5 - ES6 -	0.30	PID	<1ppm		MADE GROUND: Firm lig of ceramic and plastic. [MADE GROUND]	ght bluish grey s	ity CLAY with silt pockets and	d fragments	× 0.30 × × ×	
		_								(1.10)	
40 - 3.00 40 - 3.00 40 - 3.00	B7 - D8 - ES9 -	1.40	PID	<1ppm		Stiff bluish grey silty CLA [KIMMERIDGE CLAY FO	Y with occasiona RMATION]	l claystone banding.		× × 1.40	9.39
		_									
									× × × ×	(1.60)	
										ي بلي بلي	
	-	_							<u></u>	3.00	7.79
		_									
	- - - - -										
	-	_									+
	S	3.0		Long Axis		ion: 0.00	Groundwater s	nted on Engineer's Instructior eepage at 3 00m bgl. contamination observed.	n on achieving target d	epth.	
				Shoring / Stability: Groundw	Stable	None pription): 3.00m seepage.				Terr	nination De



rthstow ٔ mes En						10052 Easting (0 54143	OS mE)	10.64 Northing (OS mN) 266489.84	End Da	3/2022 <sup>ate</sup> 3/2022		25 heet 1	of
SAMPLE	-		TEST	S				STRATA					
Depth	Type/	Depth	Type/	Results	Water Strikes		Desc	iption		Legend	Depth (Thickness)	Level	In: Ba
	No.	-	No.	- Teodilo	- 0	MADE GROUND: Soft blui	ish grey mottle	d orangish brown slightly gravelly	/ silty	~~~~			III E
0.20	ES1	- - - 0.20	PID	<1nnm		brick.	ibangular to si	brounded fine to coarse of flint a	nd		(0.30)	ł	
0.20	E31	- 0.20	PID	<1ppm		[MADE GROUND]		Gravel is subangular to subrour	dad fina		0.30	10.34	
		-				to coarse of flint and chert.		Gravel is subangular to subrour		× × × ×		ŧ	
0.50	ES2	-				[RIVER TERRACE DEPOS	5115]			×××		ł	
		-									(0.70)	Į	
		-								$\times \times$		ł	
		-								× × , × × , × ×		ļ	
1.00	ES3	— 1.00 - 1.00	PID PID	<1ppm <1ppm				dark greenish grey silty fissured n silty clay and occasional fine d			1.00 -	9.64	
		-				rootlets. [KIMMERIDGE CLAY FOR	•			- <del>x</del> 1		Į	
		-								×		ł	
1.40 1.40	B1 D1	-							-	× ××		Į	
		-							ŀ	^ 		ŧ	
		-							ŀ	×_×_		Į	
		-								]		ŧ	
		-								<u></u>		ł	
		-								×	(2.00) -	†	
		-								<u></u>		ł	
		-							3	×		ŧ	
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		-								×_×_		ł	
2.80 2.80	B2 D2	-								×		ŧ	
2.00		-								×_×_		7.64	
		-									3.00 -	- 7.64	,
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N DETAIL	_S			I on - A. 1	Orianter		Remarks	ated on Engineer's Instruction on	achieving +	arnet de	oth		
-		3.0			s Orientati		No groundwat	ated on Engineer's Instruction on er encountered. f contamination observed	achieving t	aiyet dê	JUI.		
					(	0.00	INO EVIDENCE C	f contamination observed.					
					Support:								
				1 00m		nstability between 0.30 and					<b>□ -</b>	in e 4	<u> </u>
				Groundw	ater (deso	cription): Not encountered.						nination	
⊥ └────												3.00r	n

#### TP2C118

orthstow ent omes En						100523 Easting (O 541342	S mE) Northing (OS mN)	17/03/20 End Date 17/03/20		:25 Sheet 1	of
SAMPLE	<u> </u>		TEST	s	. 0		STRATA			1	
Depth	Type/ No.	Depth	Type/ No.	Results	Water Strikes		Description	Leger	Depth (Thickness)	Level	Ins Ba
0.20	ES1	0.20	PID	<1ppm			m orangish brown and mottled dark brown al pockets of orangish brown silty sandy g rounded fine to coarse flint.		(0.40)	ļ	
0.50	ES2	- 0.50 -	PID	<1ppm		orangish brown silty sandy g	rey silty gravelly CLAY with occasional pock gravel and pockets of orangish brown silty of d fine to coarse of flint and quartzite. ITS]	clay. Gravel		11.91	
1.00	ES3	— 1.00 -	PID	<1ppm				* <u>*</u> ***	(1.00)	÷	
1.20 1.20	B1 D1	• • •				Stiff greenish brown silty ev	tremely closely space fissured CLAY with r			10.91	
	-	- - - - - - - - - - -					and occasional sand of selenite crystals .	are pockets x			
		· · · · ·							(1.60)	- - - - - - - -	
2.80 2.80	B2 D2	- - - -						× ×		9.31	
AN DETAIL	s	-				 	Remarks				
		3.0			(	ion: T N 0.00 N	rial pit terminated on Engineer's Instructior lo groundwater encountered. lo evidence of contamination observed.	on achieving target	depth.		
3				Shoring / Stability: Groundwa	Stable	None pription): Not encountered.			Terr	mination 3.00r	

Logged By Checked By HS CPr

orthstov orthstov omes Er						10052307 12.13 1 Easting (OS mE) Northing (OS mN) En	art Date 7/03/2022 d Date 7/03/2022		25 1eet 1	of
SAMPL	Ŭ.		TEST	S		STRATA				T
Depth	Type/	Depth	Type/	Results	Water Strikes	Description	Legend	Depth (Thickness)	Level	In: Ba
	No.		No.			MADE GROUND: Soft orangish brown grey silty gravelly CLAY with a low cobble content and occasional pockets of organic clay. Gravel is subangular to				
0.20	ES1	- 0.20	PID	<1ppm		subrounded fine to coarse of flint and brick. Cobbles are angular or brick. [MADE GROUND]		(0.50)		≝
		-						(0.50)		≝
0.50	ES2	- - - 0.50	PID	<1ppm				0.50	- 11.63	
		-				Firm to stiff light greenish grey silty gravelly CLAY with occasional pockets of orangish brown silty sandy gravel and pockets of orangish brown silty clay. Gravel is explored to the strength of the to care of the and supertributes of the strength of t	× ×			
		-				is subangular to subrounded fine to coarse flint and quartzite. [RIVER TERRACE DEPOSITS]	×			
		-					×	(0.60)		
1.00	ES3	- 1.00	PID	<1ppm			×	-	-	
		-				Orangish brown clayey sandy subangular to subrounded fine to coarse GRAVEL	· ` ` ` ` ` `	1.10	11.03	' <b>   </b>
1.20 1.20	B1 D1	-				of flint and quartzite. [RIVER TERRACE DEPOSITS]		(0.20) 1.30	10.83	
		-				Stiff greenish brown silty extremely closely spaced fissured CLAY with rare pockets of orangish brown silty clay and occasional sand of selenite crystals.	×_^	1.30	10.03	
		-				[KIMMERIDGE CLAY FORMATION]	×_×_		-	
		-								
		-					×			
		-								
		-						-	-	
2.20	B2	-					×_×_	(1.70)		
2.20	D2	-					×_×_			
		-					×_×			
		-					<u>×_</u>		-	
		-					×_×_			
		-								
		-					×	3.00 -	- 9.13	
		-						0.00		
		-								
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		-								
		-								
		-								
N DETAI	1.5	-				Remarks		-		
		3.0		Long Axis	s Orientat	ion: Trial pit terminated on Engineer's Instruction on achievi	ng target de	pth.		
					(	0.00 No groundwater encountered. No evidence of contamination observed.				
				Shoring /	Support.	None				
				Stability:						
				Groundw	ater (deso	sription): Not encountered.			ination	
									3.00r	n
		nless other eoth (m). Di		Stability: Groundw	ater (desc		Lo	gged By	3.(	00n

rthstow t mes En						Project N 10052 Easting ( 54137	2 <b>307</b> (OS mE)	Ground Level (mAOD) <b>12.40</b> Northing (OS mN) <b>266429.97</b>	Start Date 17/03/202 End Date 17/03/202	2 1	:25 heet 1	of
SAMPLE	s		TEST	S	, <i>0</i>			STRATA				T
Depth	Type/	Depth	Type/	Results	Water Strikes		Des	cription	Legend	Depth (Thickness)	Level	Ins Bao
0.20	No. ES1	0.20	No. PID	<1ppm		MADE GROUND: Soft to t occasional pockets of orga of brick fragments. [MADE GROUND]	firm orangish	and mottled brown silty gravelly vel is angular to subangular fine	CLAY with	(0.40)		
0.50	ES2	- - - 0.50	PID	<1ppm			n silty gravelly	rown silty gravelly CLAY with occ sand. Gravel is subangular to su		0.40	12.00	
0.90 0.90 1.00	B1 D1 ES3	- - - - - 1.00	PID	<1ppm		Stiff greenish grey silty ex	tremely closel	y spaced fissured CLAY with rar		(0.60) 1.00	1 	
							y and occasio	nal sand size selenite crystals.			- - - - - - - - - - - - - - - - - - -	
2.00	ES4	- 2.00	PID	<1ppm						(2.00)		<b>═║═║═║</b> ═║═║═║═
3.00 3.00	B2 D2	-								3.00	9.40	
		- - - - - - - - -										
		- - - - -										
		-								.	ļ	
N DETAIL	.S	-					Remarks					
		3.0		Long Axis		0.00	Trial pit termi No groundwa	inated on Engineer's Instruction of ater encountered. of contamination observed.	on achieving target d	epth.		
				Stability: Groundw		cription): Not encountered.				Tern	nination 3.00r	

orthstow						Easting (OS mE) Northing (OS mN) End	i Date 7/03/2022		:25 heet 1 d	of
				_		Γ	103/2022	<u> </u>		
SAMPLE	S Type/		TEST Type/		Water Strikes	STRATA	I	Depth (Thickness)	Level	Ins Bao
Depth 0.20	No. ES1	Depth 	No.	Results	> 0	Description MADE GROUND: Soft to Firm orangish brown silty gravelly CLAY with occasional pockets of greenish grey silty clay. gravel is occasional subangular-subrounded fine to coarse flint and rare clay pipe fragments. [MADE GROUND]	Legend	(0.30)		
0.50	ES2	- - - - - - -	PID	<1ppm		Firm light greenish grey mottled orangish brown silty gravelly CLAY occasional pockets of orangish brown silty gravelly sand. Gravel is subangular to subrounded fine to coarse flint. [RIVER TERRACE DEPOSITS]		0.30		
1.00 1.10 1.10	ES3 B1 D1	- 	PID	<1ppm		Stiff greenish grey silty extremely closely spaced fissured CLAY with rare pockets of orangish brown silty clay and occasional sand of selenite crystals. [KIMMERIDGE CLAY FORMATION]		1.30	11.03	
								(1.70)		
2.60 2.60	B2 D2	-								
								3.00 -	9.33	
		-							Į	
NESS		-						-		
	.S	3.0		Long Axis		Remarks           on:         Trial pit terminated on Engineer's Instruction on achievin No groundwater encountered.           0.00         No evidence of contamination observed.	g target de	pth.		
				Shoring / Stability: S Groundwa	Stable	None ription): Not encountered.		Term	nination D	)et

ect orthsi nt mes	towe Englan	d					10052307 Easting (OS mE) 541281.95	11.74 Northing (OS mN) 266578.57	21/03/ End Date 21/03/		1:4 Sh	50 neet 1	of 1
	ples		Tests		Progr	ess		Strata			1000		
Type +	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water	The areas	Description	-	Legend	Depth (Thickness)	Level	Insta Back
				Dopar	21/03/2022	Depth 0.00 Dry	MADE GROUND:	Soft brown silty gravelly CLAY w	ith occasional	<u> </u>	(0.20) 0.20		4
(ES1	1) 0.20				11.50	Day	Gravel is angular to [MADE GROUND]	and rare gravel size pockets of o subrounded fine to medium of	brick.		0.20	11.54	2
	2) 0.50 ) 0.70						Firm to stiff light gr	eenish grey silty CLAY with rare h brown silty clay and occasiona	20mm			ŧ	
	-					1.1	crystals. [KIMMER DGE CL					Į	1
	3) 1.00 20-1.65	SPT(S) 1.20	N=11 (1,1/2,3,3,3)	Dry				ATTORMATION	2		(205)	ŧ	
(D2) 1	20-1.65 .20-1.65	51 ((5) 1.20	n=n (1, n2,0,0,0)	Diy			1		2		(2.05)	ŧ	
	5.1											ŧ	
(ES4	1) 1.80	SPT(C) 1.80	N=25 (11,7/7,5,6,7)	Dry	21/03/2022 12:30	0.00 Dry		Occasional si	ell fragments.			ŧ.	
	1										2.25	9.49	
	DR LLING	TECHNIQUE Type	CHISEL	- NG Durati	- - Date/T	_	WATER OBSERVATI		ASING DIAMETE				ED
rom .00 .20	To 1.20 1.80	Type Inspection Pit Dynamic Sample	From To	Duratio	on Date/T	ime S	ылке At Time (mins) R		epth Casing Dia. D 2.25	epth	From	10 V	olume
					-	-							
narks Idow s around	ample tern dwater end	ninated due to ref	usal at 2.25m due to	claystone	e band.								
evider	ice of cont	amination observ	ed.								Term	ination D	epth:
												2.25	



t	towe Englan	d					10052307 Easting (OS mE) 541337.77	11.33 Northing (OS mN 266548.26	AOD) I)		End D	3/2022 ate 3/2022	1:4 Sh	<sup>ile</sup> 50 leet 1	of 1
	ples		Tests		Progr	ess		Strat	a				-		
Type +	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	File concession	Description	1.0		4	Legend	Depth (Thickness)	Level	Insta Back
(EC.4	1) 0.20				21/03/2022	0.00 Dry	MADE GROUND: Soft of sandy CLAY with occasi	rangish brown	and mottle	ed brown	silty	XXXX	(0.30)		4
							brown sand and rare co and fine roots and roote	arse gravel size				1888	0.30 (0.30)	11.02	1
(D1) (ES2	) 0.50 2) 0.50						[MADE GROUND] MADE GROUND: Soft t		brown a	nd mottled	1		0.60	10.72	
(FS3	3) 1.00						orangish brown silty gra	velly CLAY.				x		ŧ	
(D) 1.	20-1.65	SPT(S) 1.20	N=12 (2,1/4,2,3,3)	Dry			Firm to stiff light bluish g orangish brown silty cla	and occasion	al sand siz	sional poo	kets of gravel			Ŧ	
(D2) 1	.20-1.65						size selenite crystals an [KIMMER DGE CLAY F	d fine decaying DRMATION]	rootlets.					ŧ	
														ŧ	12
(D3) 2	.00-2.45	SPT(S) 2.00	N=15 (2,2/3,3,4,5)	Dry								x	(2.65)	ŧ	11
												×		Į	5%
		1.00	100									x		ŧ	14
		SPT(C) 2.80	N=33 (13,5/7,10,8,8)	Dry								x		ŧ	11
		_			. · · · ·							×	-	ŧ	24
					21/03/2022 15:20	0.00 Dry	Y				-	×	3.25	8.07	11
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0 m	DR LLING	TECHNIQUE Type	CHISELL Hard Strata	NG Duratio	on Date/T	_	ATER OBSERVATIONS	Casing Sealed	HOLE Hole Dia.	Depth Ca	DIAME	TER Depth	-		ED /olume
00 20	120 3.25	Inspection Pit Dynamic Sample	From To	contacto	L/ate/1		ruse in the (nuns) ruse io	osanig oedied	77 67	2.00 3.25	ang olat.	o span	- rout		anal DC
															_
arks dow s	ample terr	minated due to re	fusal at 3.25m due to	claystone	e band.										
ground evider	dwater end nce of cont	countered. amination observ	ved.										<b>F</b>	ineti T	loc f
													Term	ination D	
					Equipme	_							gged By	Check	

Type + Depth SPT(S) 1.20 SPT(S) 2.00 SPT(S) 2.70	Tests Results N=10 (1,1/2,2,3,3) N=13 (1,1/2,3,4,4) N=28 (16,7/7,6,7,8)	Water Depth Dry Dry Dry	Progre Date & Time. 16/03/2022 08:00	Casing & Water Depth 0.00 Dry	Strata Description MADE GROUND: Soft light brown silty gravelly CLAY with occasional 100 - 200mm pocket of greenish grey silty clay a rare fine roots. gravel is subangular to subrounded fine to o of flint. (MADE GROUND) Firm bluish grey mottled orangish brown silty gravelly CLAY occasional selenite crystals. Gravel is subangular fine and medium of siltstone. [KIMMER DGE CLAY FORMATION] Firm greenish grey silty CLAY with rare selenite crystals. [KIMMER DGE CLAY FORMATION]	with	Depth (Thickness) (0.65) (0.65) (1.15) 1.80	Level 11.19	
SPT(S) 1.20 SPT(S) 2.00	N=10 (1,1/2,2,3,3) N=13 (1,1/2,3,4,4)	Depth Dry Dry	16/03/2022	0.00	MADE GROUND: Soft light brown silty gravelly CLAY with occasional 100 - 200mm pocket of greenish grey silty clay a rare fine roots. gravel is subangular to subrounded fine to c of flint. [MADE GROUND] Firm bluish grey mottled orangish brown silty gravelly CLAY occasional selenite crystals. Gravel is subangular fine and medium of siltstone. [KIMMER DGE CLAY FORMATION] rootlets n	with	(Thickness) (0.65) 0.65 (1.15)	11.19	
SPT(S) 2.00	N=13 (1,1/2,3,4,4)	Dry Dry		0.00	occasional 100 - 200mm pocket of greenish grey silty clay a rare fine roots. gravel is subangular to subrounded fine to or of flint. [MADE GROUND] Firm bluish grey mottled orangish brown silty gravelly CLAY occasional selenite crystals. Gravel is subangular fine and medium of siltstone. [KIMMER DGE CLAY FORMATION] rootlets n	with	(1.15)		
SPT(S) 2.00	N=13 (1,1/2,3,4,4)	Dry			[MADE GROUND] Firm bluish grey mottled orangish brown silty gravelly CLAY occasional selenite crystals. Gravel is subangular fine and medium of siltstone. [KIMMER DGE CLAY FORMATION] rootlets n Firm greenish grey silty CLAY with rare selenite crystals.	× ×	(1.15)		
					rootlets n			10.04	
					Firm greenish grey silty CLAY with rare selenite crystals. [KIMMER DGE CLAY FORMATION]	x	1.80	10.04	· ·
SPT(S) 2.70	N=28 (16,7/7,6,7,8)	Dry				x		ļ.	1 1 1
-					Becoming	stiff.	(1.35)		
			16/03/2022 09:00	0.00 Dry		×	3.15	8.69	
								Ē	
CHNIQUE	CHISELI	NG		V	VATER OBSERVATIONS HOLE/CASING		WATE	RADDE	Ð

oject orthsto ient omes E		d					Project No. 10052307 Easting (OS mE) 541405.08	Ground Level (mAOD) 11.61 Northing (OS mN) 266520.78	End D	3/2022		50 neet 1	of 1
Sampl	es		Tests		Progr	ess	1.2	Strata			1.5.2		Inches
Type + D	lepth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water	The fact according	Description	11.00	Legend	Depth (Thickness)	Level	Insta Back
(ES1) (	0.10	and the second sec		Dobai	16/03/2022	Depth 0.00 Dry	MADE GROUND:	Soft dark grey slightly silty grave I is subangular to subrounded fi	Ily CLAY with	XXX	(8:15)	11.46	4
	e. 1				12.00	Day	flint.	r is subangular to subrounded h	ne to coarse or	×		Ŧ	2
(ES2) (	0.50							grey slightly silty gravelly CLAY	Gravel is	×	(0.60)	ŧ	
(B1) 0.80	0-1.20						<b>IPOSSIBLE REWO</b>	ounded fine to coarse of flint. DRKED NATURAL DEPOSITS]			0.75	10.86	
(ES3) 1	10 million (1990)	(cantan)	Sec. Sec.	T			subrounded fine to	ayey gravelly SAND. Gravel is s coarse of flint and quartzite.	ubangular to		(0.45)	ŧ	
(D1) 1.20	)-1.65	SPT(C) 1.20	N=10 (1,2/2,2,3,3)	1.10				y CLAY with rare orangish brow	n clay pockets	x	1.20	10.40	71
			P				and rare sand size [KIMMER DGE CL	selenite crystals. AY FORMATION]		X		ŧ,	11
	20		12							x		ŧ	14
(D) 2.00 (D2) 2.00	-2.45	SPT(S) 2.00	N=15 (2,2/3,3,5,4)	1.10						x_^		Ŧ	11
1										×	(1.95)	ŧ	11
		1.000								x		Ŧ	14
	1	SPT(C) 2.70	N=42 (10,5/6,14,14,8)	1.10				Beco	ming very stiff.	- <u>x</u>		ŧ	14
						121				x		ŧ	24
					16/03/2022 13:30	2.00 Dry	11				3.15	8.46	
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_		TECHNIQUE	CHISELL	-		_	WATER OBSERVATIO		CASING DIAME				_
rom 0.00	To 1.20 3.15	Type Inspection Pit	Hard Strata From To	Duratio	on Date/T 16/03/2022		Strike At Time (mins) Ri 1.10		epth Casing Dia. 2.00 87 3.15	Depth 2.00	From	To \	/olume (
1.20	a.10	Dynamic Sample						67 3	5.10	91			
narks ndow sar	nple tern	ninated due to re	fusal at 3.15m due to o	laystone	e band.								
		ved at 1.10m. amination observ	ved.								Tern	nination D	epth:
												3.15	
		Unless otherw	ing stated		Equipme	nt Llead				10	gged By	Check	10

orthsto ent omes l	owe Englan	d					Easting (OS mE) Northing (OS mN) End	03/2022 Date 03/2022		50 neet 1	of 1
Samp	les		Tests		Progr		Strata		Depth		Insta
Type + (	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water Depth	Description	Legend	(Thickness)	Level	Back
(ES1)	0.20				16/03/2022 09:20	0.00 Dry	MADE GROUND: Soft brown silty gravelly CLAY with occasiona fine roots. Gravel is subangular to subrounded fine to coarse of flint, brick and concrete with fragments of clay pipe.		(0.55)	I	4.9
(ES2)	0.50						[MADE GROUND] Firm bluish grey slightly gravelly CLAY with occasional rootlets.		0.55	10.76	
	1.1			T			Gravel is subangular to subrounded fine to coarse of flint and limestone.		(0.35) 0.90	10.41	
(ES3)	1.00	SPT(C) 1.20	N=15 (3,3/4,4,3,4)	Dry			\[MADE GROUND] Soft orangish brown slightly gravelly very sandy CLAY. [POSSIBLE RIVER TERRACE DEPOSITS]		(0.60)	ŧ	
		51 1(6) 1.20	11-10 (0,017,1,0,17)	213			[POSSIBLE RIVER TERRACE DEPOSITS] Firm to stiff bluish grey with occasional orangish brown mottling		1.40	9.91	
(B1) 1.5	0-2.00						Slightly sitty CLAY. [KIMMER DGE CLAY FORMATION]	×		Ŧ	11
(D1) 2.0	0.245	SPT(S) 2.00	N=11 (3,2/3,2,3,3)	1.20				<u></u>		ŧ	25
(01)2.0	U-2.45	51 1(5/2.00	N=11 (0,210,2,0,0)	1.20						ŧ	14
(D2) 2.5	0-2.90							x	(2.05)	Į	12
				1.				x		ŧ	11
		SPT(S) 3.00	N=20 (3,2/5,4,5,6)	1.20				x		Ŧ	19
						1.1		x		ŧ	23
					16/03/2022 11:00	2.00 1.2		x	3.45	7.86	12
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D	RLLING	TECHNIQUE	CHISELI	NG	1		VATER OBSERVATIONS HOLE/CASING DIAM	ETER I	WATE	RADD	ED
rom	То	Туре	Hard Strata From To	Duratio	on Date/T		rike At Time (mins) Rise To Casing Sealed Hole Dia. Depth Casing Dia 0.90 87 2.00 87	Depth	From	To \	/olume
0.00 1.20	120 3.45	Inspection Pit Dynamic Sample	91011		No de 202		0.90 87 2.00 87 87 3.45	2.00			
marks	mal- t	instal F		hieritert	ornot d - f	-1				1	-
oundwat	er seepa	ninated on Engine ge observed at 0 amination observ	eer's Instruction on ac 90m. ed.	nieving t	arget depth.						
Month									Tern	nination D	
										3.45	m

ent	towe Englan	d					10052307         11.06           Easting (OS mE)         Northing (OS n           541405.35         266460.30	nN) 5	16/03/2022 End Date 16/03/2022		50 neet 1	of 1
Sam	ples		Tests		Progr	ess	Str	ata		Death	2.71	Insta
Type +	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water	Description		Legend	Depth (Thickness)	Level	Back
(ESt	) 0.05				16/03/2022	Depth 0.00 Dry	MADE GROUND: Orangish brown ve Gravel is subangular to subrounded f	ry silty sandy GRAVE		0.10	10.96	4
	100				11.00	Day	\IMADE GROUNDI		/ <u>×</u> _		Ŧ	2
(ES2	2) 0.50						Firm bluish grey silty CLAY with rare s [KIMMER DGE CLAY FORMATION]	selenite crystals.	x		ŧ	
									x		ŧ	
	) 1.00		Sector Sector						x		ŧ.	
(D) 1. (D1) 1	20-1.65 .20-1.65	SPT(S) 1.20	N=14 (2,1/2,3,3,6)	Dry					×		ŧ	
									x	(3.07)	Ŧ	
									x	(3.07)	‡2	
(D2) 2	00-2.45	SPT(S) 2.00	N=13 (2,3/2,3,4,4)	Dry					<u>x_</u>		ŧ	
									×		ŧ	
	1.1		0.000						x		ŧ.	-
(D) 2.	70-2.80 .70-2.80	SPT(C) 2.80	N=39 (25,0/15,10,6,8)	Dry							I	11
(03)2	.70-2.00	011(0)2.00	11-55 (25,5115,15,55,5)	5.9				Becoming ver	x		1	19
					16/03/2022 15:30	0.00 Dry				3.17	7.89	112
					13.30	Lity					Ŧ	
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										3	ŧ	
										1.0	ŧ	
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1	RLLING	TECHNIQUE	CHISELL	NG	1		ATER OBSERVATIONS	HOLE/CASING	DIAMETER	WATE	RADD	ED
rom	То	Туре	Hard Strata From To	Duratio	on Date/T	_	rike At Time (mins) Rise To Casing Seale	d Hole Dia. Depth Ca	sing Dia. Depth			/olume
.00	1.20 3.17	Inspection Pit Dynamic Sample	1000					77 2.00 67 3.17				
narks									1.5	-		
ndow s	ample tern dwater enc	ninated due to re	efusal at 3.17m due to o	laystone	e band.							
evider	ice of cont	ountered. amination observ	ved.								inati- P	orth
										Tern	ination D 3.17	
											J. 1/	111

oject orthst ent omes	towe Englan	d				£.	10052307 11.13 Easting (OS mE) Northing 541457.20 26645	OS mN) <b>3.14</b>	End D	3/2022 ate 3/2022	1: Sh	50 leet 1	of 1
	ples		Tests		Progr	ess		Strata			155		Inches
Type +	Depth	Type + Depth	Results	Water Depth	Date & Time	Casing & Water	Desc	iption	1001	Legend	Depth (Thickness)	Level	Insta Back
					21/03/2022	Depth 0.00 Dry	MADE GROUND: Soft brown silt roots and rootlets. Gravel is suba	gravelly CLAY wi	th occasional	XXX	(0.10)	-	4
(ES1	1) 0.20				10.00	Day	coarse of flint and brick.	ngular to subround	led line to		(0.40) 0.40	10.73	2
	2) 0.50 ) 0.60						[MADE GROUND] Firm light grey mottled orangish I				(0.40)		
							occasional pockets of orangish b subangular to subrounded fine to	coarse of flint.	ivel is	-2-	0.80	10.33	
(ES3	3) 1.00		2 A and	100			IPOSSIBLE REWORKED NATU Orangish brown fine to medium	layey SAND with 1	00mm		(0.20) 1.00	10.13	
(D) 1. (D2) 1	20-1.65 .20-1.65	SPT(S) 1.20	N=11 (1,2/3,2,3,3)	Dry			pockets of soft light grey organic [RIVER TERRACE DEPOSITS]	rich clay.		x			
							Firm light greenish grey silty CLA orangish brown silty clay and sel	Y with occasional onite crystals	ockets of	x	1.5.4	ŀ	
	0						[KIMMER DGE CLAY FORMATIO	DN]		x	(1.40)		14
(D) 2.	00-2.45	SPT(S) 2.00	N=11 (2,1/2,3,3,3)	Dry						<u>x</u>		ŧ	1
	1) 2.00									x		Į.	24
							Firm greenish grey silty CLAY wi			x	2.40	8.73	11
							brown silty clay and occasional s fragments.		1 SNell	x		I	11
(D4	3.00	SPT(S) 3.00	N=11 (2,2/2,3,3,3)	Dry	<u> </u>		[KIMMER DGE CLAY FORMATIO	INC		x	(1.05)		59
					1.00					x			52
				1	21/03/2022	0.00				x	3.45	7.68	12
					11:05	Dry						ŧ.	
-		TECHNIQUE	CHISEL	-		-	VATER OBSERVATIONS		ASING DIAME			RADDI	_
rom 0.00 1.20	To 1.20 3.45	Type Inspection Pit Dynamic Sample	From To	Duratio	on Date/T	ine s	rike At Time (mins) Rise To Casing		pth Casing Dia. 00 45	Depth	From	To \	olume
ground	dwater enc	ninated on Engine countered. amination observe	eer's Instruction on ac	hieving t	arget depth.							- 0	
											Term	ination D	
												3.45	m

ve + Depth TT(S) 1.20 TT(S) 2.00 TT(S) 3.00	Tests Results N=14 (2,1/3,2,4,5) N=13 (2,1/3,3,3,4) N=23 (7,7/8,4,5,6)	Water Depth	Progre Date & Time 21/03/2022 08:00	2SS Casing & Water Depth 0.00 Dry	Strata Description MADE GROUND: Soft brown silty gravelly CLAY with occasional roots and rootlets. Gravel is subangular to subrounded fine to coarse of fint. [MADE GROUND] Firm light greyish brown mottled orangish brown sandy very gravelly CLAY with occasional pockets of orangish brown sand. Gravel is subangular to subrounded fine to coarse of fint. [POSSIBLE REWORKED NATURAL DEPOSITS] Firm light greenish grey slightly gravelly CLAY with occasional pockets of orangish brown silty clay and occasional decaying rootlets and sand size selenite crystals. [KIMMER DGE CLAY FORMATION]	Legend	Depth (Thickness) (0.40) (0.20) 0.60 (2.30)	Level	
τ(S) 1.20 τ(S) 2.00	N=14 (2,1/3,2,4,5) N=13 (2,1/3,3,3,4)	Dry	Date & Time 21/03/2022	Casing & Water Depth 0.00	MADE GROUND: Soft brown silty gravelly CLAY with occasional roots and rootlets. Gravel is subangular to subrounded fine to coarse of flint. [MADE GROUND] Firm light greyish brown mottled orangish brown sandy very gravelly CLAY with occasional pockets of orangish brown sand. Gravel is subangular to subrounded fine to coarse of flint. [POSSIBLE REWORKED NATURAL DEPOSITS] Firm light greenish grey slightfy gravelly CLAY with occasional pockets of orangish brown silty clay and occasional decaying rootlets and sand size selenite crystals. [KIMMER DGE CLAY FORMATION]		(Thickness) (0.40) 0.40 (0.20) 0.60	10.96	
T(S) 2.00	N=13 (2,1/3,3,3,4)	Dıy Dıy		0.00	roots and rootlets. Gravel is subangular to subrounded fine to coarse of flint. [MADE GROUND] Firm light greyish brown mottled orangish brown sandy very gravely CLAY with occasional pockets of orangish brown sand. Gravel is subangular to subrounded fine to coarse of flint. [POSSIBLE REWORKED NATURAL DEPOSITS] Firm light greenish grey slightly gravelly CLAY with occasional pockets of orangish brown silty clay and occasional decaying rootlets and sand size selenite crystals. [KIMMER DGE CLAY FORMATION]		0.40 (0.20) 0.60	+ 6	
T(S) 2.00	N=13 (2,1/3,3,3,4)	Dry			[POSSIBLE REVORKED NATURAL DEPOSITS] Firm light greenish grey slightly gravelly CLAY with occasional pockets of orangish brown sitly clay and occasional decaying rootlets and sand size selenite crystals. [KIMMER DGE CLAY FORMATION]		(2.30)		
							(2.30)		11
T(S) 3.00	N=23 (7,7/8,4,5,6)	Dry							1111
T(S) 3.00	N=23 (7,7/8,4,5,6)	Dry						1	11
			21/03/2022	0.00	Firm to stiff bluish grey silty CLAY with extremely weak claystone bands and occasional selenite crystals. [KIMMER DGE CLAY FORMATION]	x x x x	2.90 (0.55) 3.45	8.46 7.91	ľ,
NIQUE Type nspection Pit marric Sample	CHISELL Hard Strata From To	-	n Date/Ti			ETER Depth			ED folume
	Type spection Pit aamic Sample d on Enginee red.	Type Hard Stata spection Pit To namic Sample I on Engineer's Instruction on ac	Type         Hard Stata From         Duratio           spection Pit namic Sample         To         Duratio           d on Engineer's Instruction on achieving tated.         To         To	Type Hard Stata Duration Date/Ti spection Pit To Duration Date/Ti namic Sample don Engineer's Instruction on achieving target depth.	Type Hard Stata Duration Date/Time S spection Pit To Duration Date/Time S harmic Sample don Engineer's Instruction on achieving target depth. red.	Type     Hard Stata From     Duration     Date/Time     Strike At     Time (mins)     Rise To     Casing     Sealed     Hole Dia.     Depth     Casing Dia.       spection Pit namic Sample     To     To     Duration     Date/Time     Strike At     Time (mins)     Rise To     Casing     Sealed     Hole Dia.     Depth     Casing Dia.       spection Pit namic Sample     Image: Casing Dia.       d on Engineer's Instruction on achieving target depth.     Image: Casing Dia.     pe       Hard Strata From       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth         spection Pit namic Sample       To       To       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth         spection Pit namic Sample       To       To       To       To       To       To       To       To       Depth       Casing Dia.       Depth       Depth       To       To       To       To       Depth       To       Depth       To       To <td< td=""><td>Type       Hard Strata From       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From         Ispection Pit namic Sample       To       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To         Ispection Pit namic Sample       Image: Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To         d on Engineer's Instruction on achieving target depth.       red.      </td><td>Type       Hard Stata From       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To       Vispedion Pit namic Sample         d on Engineer's Instruction on achieving target depth.       ed.       ed.</td></td<>	Type       Hard Strata From       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From         Ispection Pit namic Sample       To       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To         Ispection Pit namic Sample       Image: Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To         d on Engineer's Instruction on achieving target depth.       red.	Type       Hard Stata From       Duration       Date/Time       Strike At       Time (mins)       Rise To       Casing       Sealed       Hole Dia.       Depth       Casing Dia.       Depth       From       To       Vispedion Pit namic Sample         d on Engineer's Instruction on achieving target depth.       ed.       ed.	

### APPENDIX D

### **CERTIFICATION OF FIELD APPARATUS**

### **SPT Hammer Energy Test Report**

in accordance with BSEN ISO 22476-3:2005

6	Borehole	
	Calibration & lesting Solutions Lts	

Unit 8 Orton Enterprise Centre Orton Southgate Peterborough PE2 6XU

#### **Instrumented Rod Data**

Diameter d <sub>r</sub> (mm):	54
Wall Thickness t <sub>r</sub> (mm):	6.3
Assumed Modulus Ea (GPa):	208
Accelerometer No.1:	11853
Accelerometer No.2:	10332

SPT Hammer Ref:	AR2411
Test Date:	20/06/2021
Report Date:	20/06/2021
File Name:	AR2411.spt
Test Operator:	PR

#### **SPT Hammer Information**

Hammer Mass m (kg): 63.0 Falling Height h (mm): 760 SPT String Length L (m): 15.0

#### **Comments / Location**

3

2

0

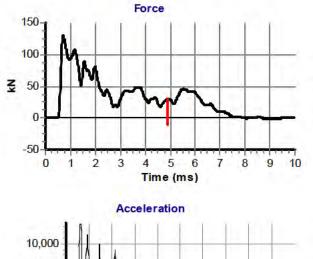
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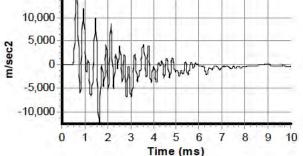
1

m/sec

Maximum calibration interval is 6 months

2 3







Time (ms)

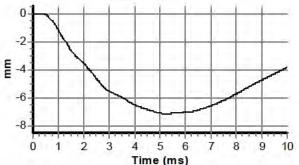
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6 7

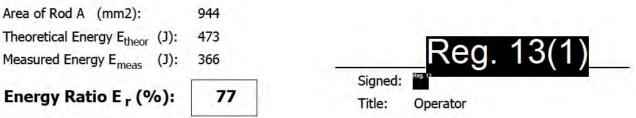
8 9

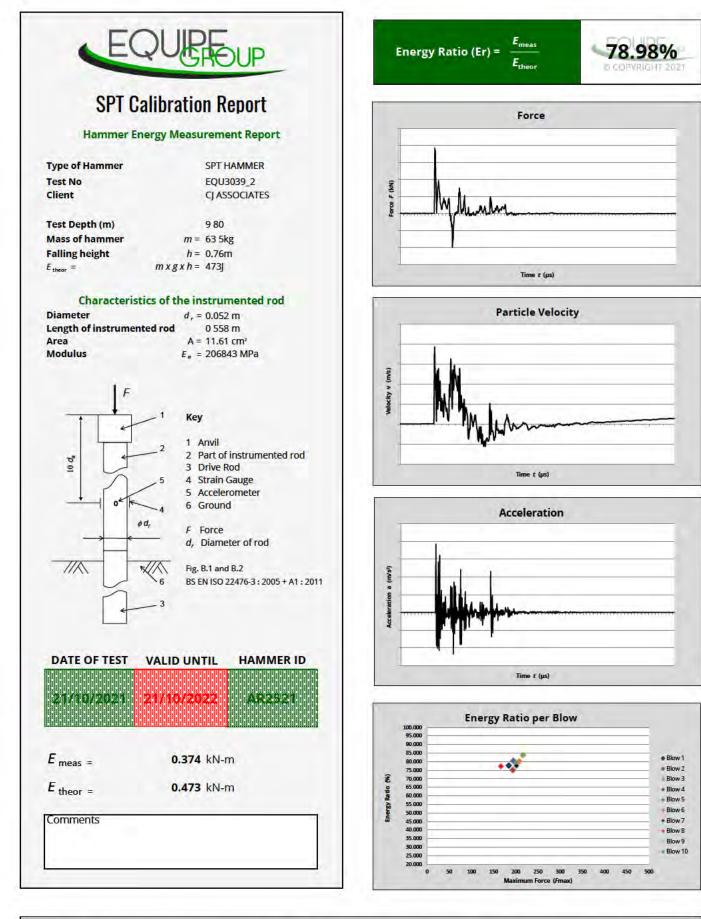
10

Velocity



#### Calculations







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# **SPT Hammer Energy Test Report**

in accordance with BSEN ISO 22476-3:2005

<b>(</b>	Borehole
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Unit 8
<b>Orton Enterprise Centre</b>
Orton Southgate
Peterborough
PE2 6XU

#### **Instrumented Rod Data**

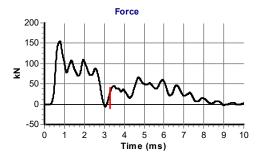
Diameter d <sub>r</sub> (mm):	54
Wall Thickness $t_r$ (mm):	6.3
Assumed Modulus $E_a$ (GPa):	208
Accelerometer No.1:	11853
Accelerometer No.2:	10332

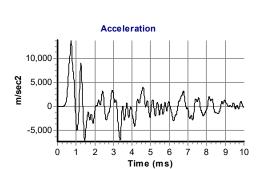
SPT Hammer Ref:	DART489
Test Date:	27/02/2022
Report Date:	27/02/2022
File Name:	DART489.spt
Test Operator:	PR

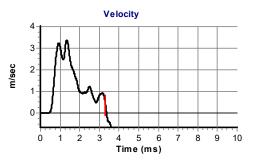
## **SPT Hammer Information**

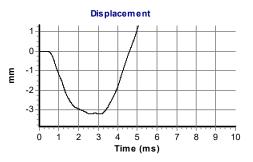
Hammer Mass	m (kg):	63.0
Falling Height	h (mm):	760
SPT String Leng	gth L (m):	15.0

## **Comments / Location**









## Calculations

Area of Rod A (mm2):	944	
Theoretical Energy E <sub>theor</sub> (J):	473	D = -40(4)
Measured Energy E <sub>meas</sub> (J):	390	Reg. 13(1)
		Signed
Energy Ratio E <sub>r</sub> (%):	82	Title: Operator

# APPENDIX E

MONITORING DATA

Well ID	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow I/h St	teady Flow l/h O	02 % min C	:H4 % max CC	02 % max CO	ppm max H2S p	pm max O	2 % last CH	4 % last CO	2 % last CO	opm last H2S p	opm last Weather
BH2C103_A	07/04/2022	987	-0.1	0.1	0	20.6	0.1	0.2	2	0	21.2	0.1	0.1	0	0 Sunny, cloudy, very windy
BH2C104_A	07/04/2022	984	0.19	0.1	0.1	8.1	0 2	3.2	0	0	8.1	0.2	3.1	0	0 Sunny, cloudy, very windy
WS2C112_A	07/04/2022	987	0.36	0	0	22.1	0 2	0.2	0	0	22.1	0.2	0.1	0	0 Sunny, cloudy, very windy
WS2C121_A	07/04/2022	986	0.12	0	0	21	0 2	2	0	0	21	0.1	0.2	0	0 Sunny, cloudy, very windy
WS2C123_A	07/04/2022	989	0.16	0	0	2.6	0 2	0.2	1	0	20.7	0.2	0.1	0	0 Sunny, cloudy, very windy
WS2C120_A	07/04/2022	988	0.54	0	0	20.7	0 2	2	2	0	21.1	0.2	0.9	0	0 Sunny, cloudy, very windy

Well ID Date Time Baro mbar Rel BH Pres mbar Peak Flow I/h Steady Flow I/h O2 % min CH4 % max CO2 % max CO ppm max H2S ppm max O2 % last CH4 % last CO2 % last CO ppm last H2S ppm last Weather

Well ID	Date	Depth to Water (m bgl)	Depth to Base (m bgl)	Weather
BH2C103_A	07/04/2022	2.744	14.86	Cloudy, cold, very windy
BH2C104_A	07/04/2022	3.413	5.53	Cloudy, cold, very windy
WS2C112_A	07/04/2022	0.474	1.29	Cloudy, cold, very windy
WS2C120_A	07/04/2022	0.656	2.45	Cloudy, cold, very windy
WS2C121_A	07/04/2022	Dry	1.62	Cloudy, cold, very windy
WS2C123_A	07/04/2022	Dry	1.52	Cloudy, cold, very windy

Well ID D	Date Time	Baro mbar	Rel BH Pres mbar	Peak Flow I/h S	iteady Flow I/h (	D2 % min	CH4 % max CO	2 % max CO	ppm max H2S pp	om max O	2 % last CH	4 % last CO	2 % last CO p	pm last H2S	opm last Weather
BH2C101_A (	08/04/2022 12:02	1000	2.54	0.1	0	15.8	0.2	0.9	1	0	15.8	0.2	0.9	1	0 Sunny, cloudy, cold
BH2C102_A (	08/04/2022 10:59	1000	0.17	0.1	0	19.8	1	0.7	7	0	19.8	1	0.7	6	0 Sunny, cloudy, cold
WS2C101_A (	08/04/2022 11:42	1000	0.02	0	0	21.6	0.2	0.2	2	0	21.6	0.1	0.2	1	0 Sunny, cloudy, cold
WS2C106_A (	08/04/2022 10:35	1000	0.03	0	0	20.2	0.1	0.4	0	0	20.2	0.1	0.4	0	0 Sunny, cloudy, cold
WS2C108_A (	08/04/2022 09:46	999	-0.05	0	0	18.6	0.3	0.3	1	0	19	0.3	0.3	1	0 Sunny, cloudy, cold
WS2C114_A (	08/04/2022 10:05	1000	0.4	0	0	21.1	0.2	0.7	2	0	21.1	0.1	0.3	0	0 Sunny, cloudy, cold

Well ID	Date	Depth to Water (m bgl)	Depth to Base (m bgl)	Weather
BH2C101_A	08/04/2022	0.497	15.10	Cloudy, cold, sunny
BH2C102_A	08/04/2022	1.298	15.30	Cloudy, cold, sunny
WS2C101_A	08/04/2022	Dry	2.00	Cloudy, cold, sunny
WS2C106_A	08/04/2022	1.099	1.56	Cloudy, cold, sunny
WS2C108_A	08/04/2022	2.033	2.78	Cloudy, cold, sunny
WS2C114_A	08/04/2022	0.923	1.67	Cloudy, cold, sunny

0.961 Clear	0	1	0.7	0.2	19.7	0	2	0.7	0.2	19.7	0.3	0.3	1 35	1014	3H2C101_ 13/04/2022 09:15
1.957 Clear	0	1	0.3	0.2	21.3	0	2	03	0.2	17 8	0.1	0.2	1.3	1014	3H2C102_ 13/04/2022 08:55
2.527 Clear	0	1	0.1	0.1	21.3	0	2	05	0.1	19 9	0.1	0.1	0.1	1015	H2C103_ 13/04/2022 10:35
3.027 Clear	0	1	1.2	0.1	16.4	1	2	12	0.1	16.4	0.1	0.1	0.19	1015	H2C104_ 13/04/2022 11:01
1.558 Clear	0	1	0.2	0.2	21.5	0	1	0 2	0.2	21 3	0.1	0.1	0 03	1014	VS2C101_ 13/04/2022 09:06
0.967 Clear	0	0	0.4	0.2	21.3	0	2	0.4	0.2	21 3	0.1	0.1	0.1	1015	VS2C106_ 13/04/2022 09:59
2.142 Clear	0	2	0.3	0.2	17.4	0	2	03	0.3	17.4	0.1	0.1	0 03	1014	VS2C108_ 13/04/2022 08:43
0.495 Clear	0	0	0.1	0.1	21.6	0	1	03	0.1	21.4	0.1	0.1	-0 01	1015	/S2C112_ 13/04/2022 10:17
1.253 Clear	0	0	0.3	0.1	21.4	0	1	05	0.1	21 2	0.1	0.1	0 03	1015	/S2C114_ 13/04/2022 10:09
0.632 Clear	0	1	0.5	0.1	21.2	0	1	1.6	0.1	20 5	0.1	0.3	0 59	1015	VS2C120_ 13/04/2022 10:26
1.071 Clear	0	1	0.1	0.1	21.6	0	1	0.1	0.1	21.4	0.1	0.1	0 01	1015	/S2C121_ 13/04/2022 10:44
Clear	0 Dry	1	0.1	0.1	21.6	0	2	0 2	0.1	21.6	0.1	0.1	0 09	1015	VS2C123 13/04/2022 10:53

Well ID	Date Time	Baro mbar Re	el BH Pres mbar	Peak Flow I/h Stea	ady Flow I/h O2	2 % min CH	H4 % max CO	2 % max CO p	pm max H2S p	pm max O	2 % last CH	4 % last CO	2 % last CO p	pm last H2S p	pm last Depth to \	Vater (m bgl) Weather
BH2C101_A	23/05/2022 09:14	1004	3.09	0.2	0.1	17.4	0	0.9	7	0	18.7	0	0.5	4	0	0.322 Cloudy
BH2C102_A	23/05/2022 08:52	1003	110.31	10.4	0.2	20	0.1	0.5	6	0	20	0	0.5	5	0	1.618 Cloudy
BH2C103_A	23/05/2022 09:51	1004	0.17	0	0	20 5	0	0.2	2	0	21 3	0	0.1	0	0	2.394 Cloudy
BH2C104_A	23/05/2022 10:15	1003	-0.05	0	0	16 2	0	2.5	1	0	16 2	0	2.5	0	0	2.907 Cloudy
WS2C101_A	23/05/2022 09:05	1004	-0.02	0	0	20.6	0	0.1	4	0	20.6	0	0.1	1	0	1.046 Cloudy
WS2C106_A	23/05/2022 09:25	1004	0.15	0	0	20.7	0	0.3	3	0	20 8	0	0.3	0	0	0.827 Cloudy
WS2C108_A	23/05/2022 08:41	1003	0.03	0	0	18.1	0.8	0.3	1	0	18.1	0.4	0.3	0	0	1.964 Cloudy
WS2C112_A	23/05/2022 09:34	1004	0.09	0	0	21 2	0	0.1	0	0	21 2	0	0.1	0	0	0.469 Cloudy
WS2C114_A	23/05/2022 10:24	1003	0.09	0	0	19.1	0	2.1	0	0	21.1	0	0.6	0	0	0.898 Cloudy
WS2C120_A	23/05/2022 09:59	1004	0.1	0	0	21.3	0	0.2	1	0	21.4	0	0.1	0	0	0.812 Cloudy
WS2C121_A	23/05/2022 09:43	1004	0.1	0	0	21.3	0	0.1	1	0	21.3	0	0.1	0	0	0.823 Cloudy
WS2C123_A	23/05/2022 10:07	1004	0.03	0	0	21.3	0	0.2	1	0	21.4	0	0.2	0	0 Dry	Cloudy

## APPENDIX F

## GEOTECHNICAL LABORATORY TEST DATA





Qty

898

99

98

29

48

13

8

# Contract Number: 58610

Report Date: 27-04-2022

Client Ref: 10052307 Client PO: 14059902

Laboratory Report

Client Arcadis Fortran Rd St Mellons Cardiff CF3 0EY

Contract Title:	North	nstowe
For the attention of:	Reg.	13(1)

Date Received: 04-04-2022 Date Completed: 27-04-2022

Test Description
------------------

#### **Samples Received**

- @ Non Accredited Test

#### **Moisture Content of Soil**

BS1377 : Part 2 : Clause 3.2 : 1990 - \* UKAS

#### **4 Point Liquid & Plastic Limit**

BS 1377:1990 - Part 2 : 4.3 & 5.3 - \* UKAS

#### **PSD Wet & Dry Sieve method**

BS 1377:1990 - Part 2 : 9.2 - \* UKAS

#### **BRE Full Suite**

includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate Sub-contracted Test

### CBR: Remoulded Specimen and tested at top only

BS 1377:1990 - Part 4 : 7 - \* UKAS

One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - \* UKAS

Notes: Observations and Interpretations are outside the UKAS Accreditation

- \* denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

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 Signatories:** 

Reg. 13(1) (Business Support Manager) - Reg. 13(1) (Director) - Reg. 13(1) (Quality/Technical Manager) Reg. 13(1) (Laboratory manager) - Reg. 13(1) (Site Manager) - Reg. 13(1) (Quality Assistant / Administrator / Health and Safety Coordinator)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk







# **Contract Number: 58610**

Test Description	Qty
Natural Shear Strength by Hand Vane (3 measurements) - @ Non Accredited Test	6
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	21
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- \* denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

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 Signatories:

 Reg. 13(1)
 (Business Support Manager) - Reg. 13(1)
 (Director) - Reg. 13(1)
 (Quality/Technical Manager)

 Reg. 13(1)
 (Laboratory manager) - Reg. 13(1)
 (Site Manager) - Reg. 13(1)
 (Quality Assistant / Administrator / Health and Safety Coordinator)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GS	TL						
Contract Number		58610 Northstowe					
Site Name							
Date Tested		5			1	8/04/2022	
Sample/Hole Reference	Sample Number	Sample Type	l - p	Depth (r	n)	Desc	riptions
WSTCA117	1	В	1.20	2	1.50	Brown	silty CLAY
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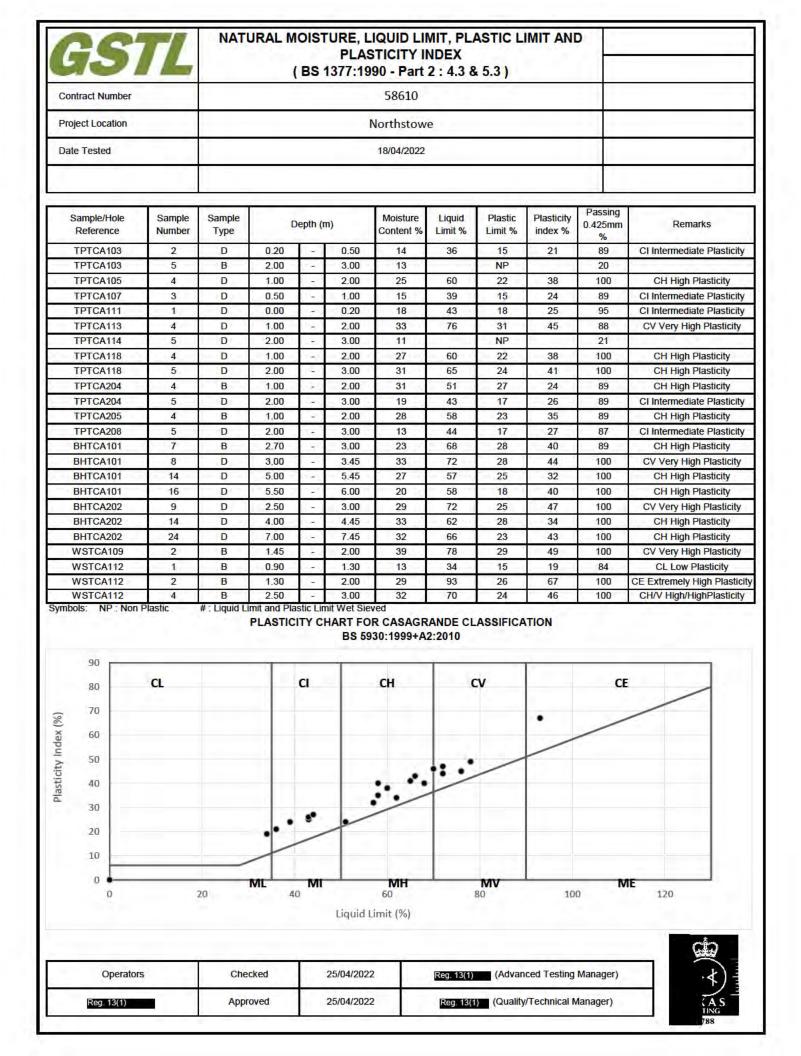
GS								
Contract Number	1.1							
Site Name						Northstow	e	
Date Tested						18/04/2022		
Sample/Hole Reference	Sample Number	Sample Type	, c	)epth (r	m)	Moisture Content %	Remarks	
WSTCA117	1	В	1.20	21	1.50	28		
	-			0				
			-	5.10				
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Operato	rs	Cher	cked	-	26/04/202		Reg. 13(1) (Advanced Te Reg. 13(1) (Quality/Techn	

<b>GS</b>	TL	NATU	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 )						
Contract Number			58610						
Site Name		-			N	orthstowe			
Date Tested					1	8/04/2022			
1				DES	CRIPTIONS				
Sample/Hole Reference	Sample Number	Sample Type	Depin (m)		n)	Descriptions			
TPTCA103	2	D	0.20	1-1	0.50	Brown gravelly sandy silty CLAY			
TPTCA103	5	В	2.00	(****	3.00	Brown silty clayey sandy GRAVEL			
TPTCA105	4	D	1.00	(i gi)	2.00	Brown silty CLAY			
TPTCA107	3	D	0.50	(15.1)	1.00	Brown gravelly sandy silty CLAY			
TPTCA111	1	D	0.00	(-2)	0.20	Brown gravelly silty CLAY			
TPTCA113	4	D	1.00	1240	2.00	Brown gravelly sandy silty CLAY			
TPTCA114	5	D	2.00	(1.9.) (1.9.)	3.00	Brown silty clayey sandy GRAVEL			
TPTCA118	4	D	1.00	(1-1)	2.00	Brown silty CLAY			
TPTCA118	5	D	2.00	121	3.00	Grey silty CLAY			
TPTCA204	4	В	1.00	0.20	2.00	Brown gravelly silty CLAY			
TPTCA204	5	D	2.00		3.00	Brown gravelly sandy silty CLAY			
TPTCA205	4	В	1.00	1.00	2.00	Brown gravelly silty CLAY			
TPTCA208	5	D	2.00		3.00	Brown gravelly silty CLAY			
BHTCA101	7	В	2.70	0.90	3.00	Brown gravelly silty CLAY			
BHTCA101	8	D	3.00	0.45	3.45	Grey silty CLAY			
BHTCA101	14	D	5.00		5.45	Brown silty CLAY			
BHTCA101	16	D	5.50	(net)	6.00	Grey silty CLAY			
BHTCA202	9	D	2.50	(1 - )	3.00	Brown silty CLAY			
BHTCA202	14	D	4.00	(1-1)	4.45	Brown silty CLAY			
BHTCA202	24	D	7.00	(12+1)	7.45	Grey silty CLAY			
WSTCA109	2	В	1.45	0.80	2.00	Brown silty CLAY			
WSTCA112	1	В	0.90	(1.en)	1.30	Brown sandy gravely silty CLAY			
WSTCA112	2	В	1.30	(194)	2.00	Brown silty CLAY			
WSTCA112	4	В	2.50	0.9%	3.00	Brown silty CLAY			



Operators Reg. 13(1) Checked Approved

25/04/2022 25/04/2022



GS	TL	NATU	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 )						
Contract Number			58610						
Site Name		-			N	lorthstowe			
Date Tested					1	8/04/2022			
					SCRIPTIONS				
Sample/Hole Reference	Sample Number	Sample Type	Depin (m)		n)	Descriptions			
WSTCA116	1	В	1.20	1	1.50	Brown silty CLAY			
WSTCA116	3	В	2.00	1.4	2.50	Brown silty CLAY			
WSTCA116	4	В	2.50	0.90	3.00	Brown silty CLAY			
BHTCA102	10	В	3.00	1240	3.50	Grey silty CLAY			
BHTCA102	9	D	3.45	(ne)	3.55	Brown silty CLAY			
BHTCA102	14	D	4.50	1.40	5.00	Grey silty CLAY			
BHTCA102	21	D	6.50	1.22	7.00	Grey gravelly silty CLAY			
BHTCA102	23	D	7.45	(19-1)	7.55	Brown silty CLAY			
BHTCA103A	5	D	2.70		3.00	Brown silty CLAY			
BHTCA103A	7	D	3.45	0.20	3.50	Brown silty CLAY			
BHTCA103A	12	В	6.00	(194)	6.50	Grey silty CLAY			
BHTCA103A	15	D	7.45	-	7.50	Brown silty CLAY			
BHTCA103A	17	D	8.80		9.00	Grey silty CLAY			
BHTCA103A	24	В	13.50	0.20	14.00	Grey silty CLAY			
TPTCA104	3	D	0.80	0.45	1.70	Brown gravelly silty CLAY			
TPTCA104	4	D	1.70		3.00	Brown gravelly silty CLAY			
TPTCA119	4	D	1.20	(net)	3.00	Brown silty CLAY			
BHTCA104	5	D	1.70	(1 - 1)	2.00	Brown gravelly sandy silty CLAY			
BHTCA104	6	В	2.00	0.40	2.50	Brown silty CLAY			
BHTCA104	11	D	4.00	(lef)	4.45	Grey silty CLAY			
BHTCA104	16	D	5.50	0.80	6.00	Brown silty CLAY			
BHTCA104	19	D	6.50	()	7.00	Grey silty CLAY			
BHTCA108	6	D	2.45	9	2.50	Brown silty CLAY			
BHTCA108	7	D	3.00	0.90	3.45	Brown silty CLAY			

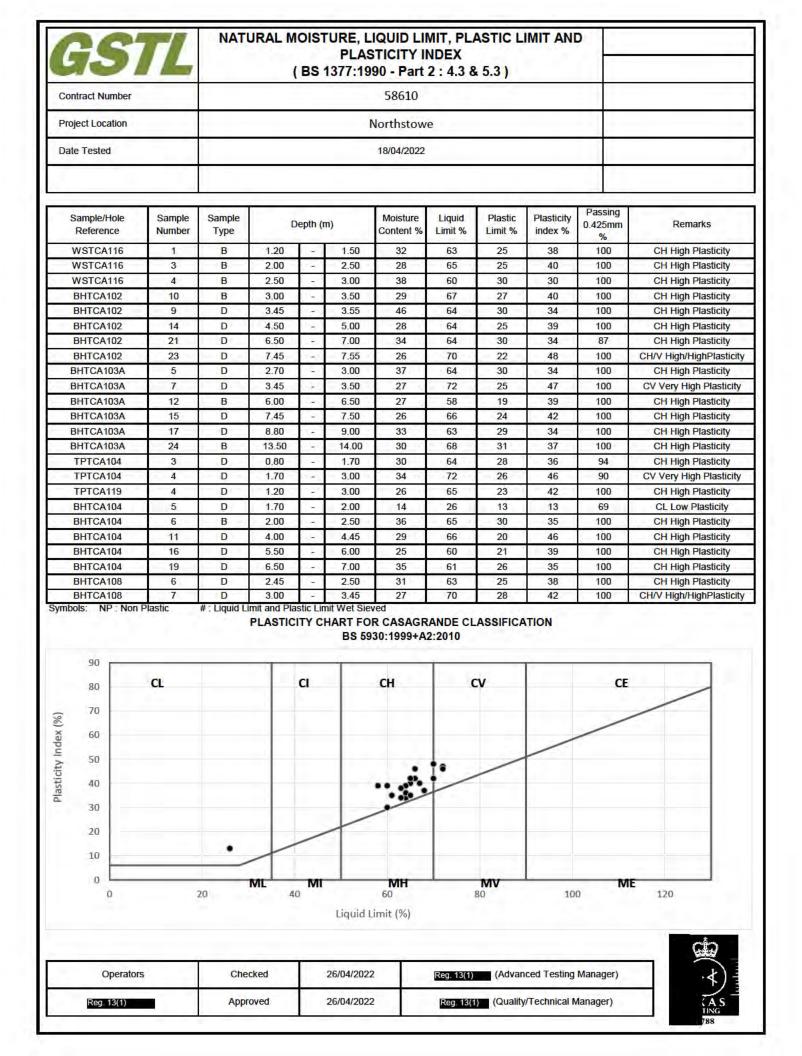


Operators Reg. 13(1)

Checked Approved

26/04/2022 26/04/2022

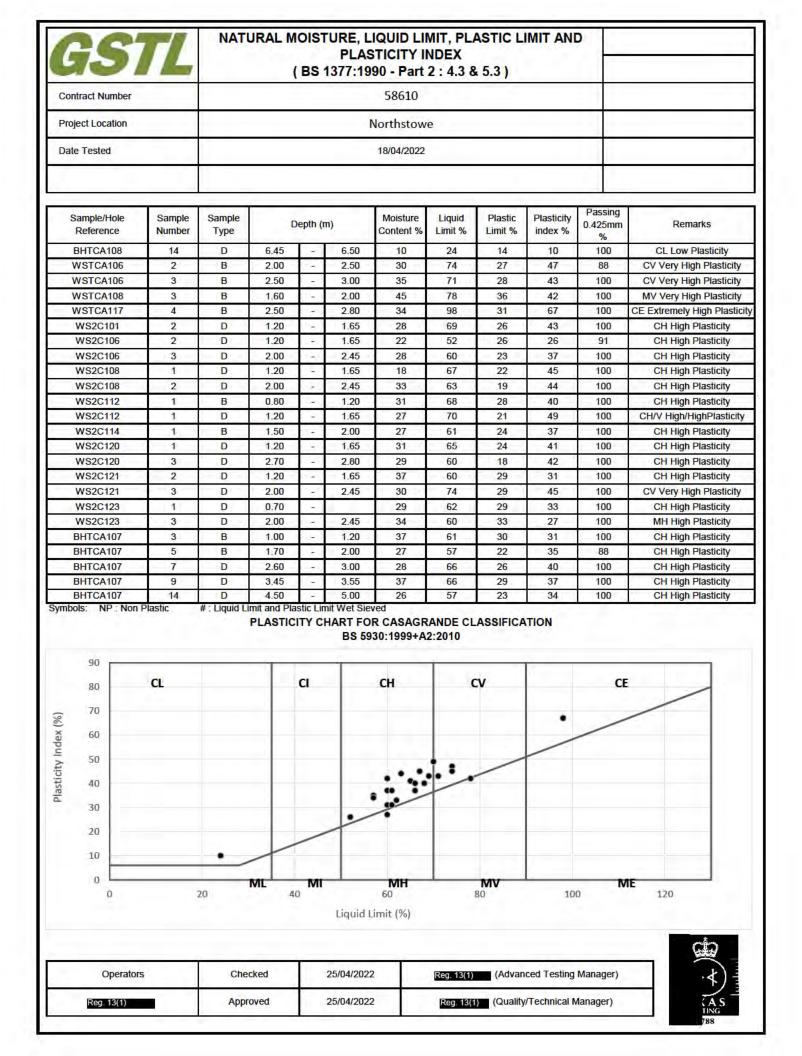
Reg. 13(1) (Quality/Technical Manager)



<b>GS</b>	TL	NATU	QUID LIMIT, PLASTIC LIMIT AND TICITY INDEX 90 - Part 2 : 4.3 & 5.3 )				
Contract Number		58610					
Site Name					N	lorthstowe	
Date Tested					1	8/04/2022	
1			SCRIPTIONS				
Sample/Hole Reference	Sample Number	Sample Type	C	epth (n	n)	Descriptions	
BHTCA108	14	D	6.45	1.41	6.50	Brown silty CLAY	
WSTCA106	2	В	2.00	1.2	2.50	Brown gravelly silty CLAY	
WSTCA106	3	В	2.50	0.90	3.00	Brown silty CLAY	
WSTCA108	3	B	1.60	(1-1)	2.00	Brown clayey SILT	
WSTCA117	4	В	2.50	(2n)	2.80	Brown silty CLAY	
WS2C101	2	D	1.20	0.90	1.65	Brown silty CLAY	
WS2C106	2	D	1.20	1.20	1.65	Brown gravelly silty CLAY	
WS2C106	3	D	2.00	1940	2.45	Grey silty CLAY	
WS2C108	1	D	1.20	1.5	1.65	Brown silty CLAY	
WS2C108	2	D	2.00	0.20	2.45	Brown silty CLAY	
WS2C112	1	В	0.80		1.20	Brown silty CLAY	
WS2C112	1	D	1.20	1.00	1.65	Brown silty CLAY	
WS2C114	1	В	1.50	19	2.00	Brown silty CLAY	
WS2C120	1	D	1.20	0.20	1.65	Brown silty CLAY	
WS2C120	3	D	2.70	0.45	2.80	Brown silty CLAY	
WS2C121	2	D	1.20		1.65	Brown silty CLAY	
WS2C121	3	D	2.00	(nati	2.45	Brown silty CLAY	
WS2C123	1	D	0.70	-		Brown silty CLAY	
WS2C123	3	D	2.00	(Leg)	2.45	Brown clayey SILT	
BHTCA107	3	В	1.00	(1-1)	1.20	Grey silty CLAY	
BHTCA107	5	В	1.70	신동안	2.00	Brown gravelly silty CLAY	
BHTCA107	7	D	2.60	(ien)	3.00	Grey silty CLAY	
BHTCA107	9	D	3.45	0.90	3.55	Brown silty CLAY	
BHTCA107	14	D	4.50	0.9%	5.00	Grey silty CLAY	

Operators	Checked	25/04/2022	Reg. 13(1) (Advanced Testing Manager)
Reg. 13(1)	Approved	25/04/2022	Reg. 13(1) (Quality/Technical Manager)





GS	TL	NATU	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377:1990 - Part 2 : 4.3 & 5.3 ) 58610						
Contract Number									
Site Name					N	lorthstowe			
Date Tested					1	8/04/2022			
		DESCRIPTIONS				SCRIPTIONS			
Sample/Hole Reference	Sample Number	Sample Type	C	)epth (n	n)	Descriptions			
BHTCA107	16	D	5.50	1-1	6.00	Grey silty CLAY			
BHTCA107	25	D	8.50	(1997)	9.00	Grey silty CLAY			
BHTCA110	7	D	2.80	Ú 90	3.00	Brown silty CLAY			
BHTCA110	9	D	3.80	(1 - 1)	4.00	Grey sitty CLAY			
BHTCA110	12	В	5.00	()	5.50	Grey silty CLAY			
BHTCA110	15	D	6.80	0.90	7.00	Grey silty CLAY			
BHTCA301A	10	В	2.00	(1. <del>.</del> )	2.50	Brown silty clayey GRAVEL			
BHTCA301A	12	D	3.00	(n-1)	3.45	Grey silty CLAY			
BHTCA301A	16	D	4.45		4.50	Grey silty CLAY			
BHTCA301A	19	D	6.00	0.20	6.10	Grey silty CLAY			
BHTCA301A	22	D	7.45	1.00	7.50	Grey silty CLAY			
BH2C101	11	D	2.45	9	2.50	Brown silty CLAY			
BH2C101	15	D	4.45		4.50	Grey silty CLAY			
BH2C101	18	D	6.45	0.20	6.50	Brown silty CLAY			
BH2C102	7	D	2.50	0.45	3.00	Brown silty CLAY			
BH2C102	10	D	3.50		4.00	Grey silty CLAY			
BH2C102	12	D	4.45	that	4.55	Grey silty CLAY			
BH2C102	20	D	6.50	18	7.00	Grey silty CLAY			
BH2C103	17	D	1.20	(1-1)	1.65	Brown silty CLAY			
BH2C103	19	D	4.45	$(k_{\mathcal{T}})$	4.50	Brown silty CLAY			
BH2C103	20	D	6.45	0.50	6.50	Brown sitty CLAY			
BH2C103	21	D	7.00	(1, -1)	7.45	Brown silty CLAY			
BH2C104	14	В	3.70	9		Brown gravelly silty CLAY			
BH2C104	18	D	5.00	0.9%	5.45	Brown silty CLAY			

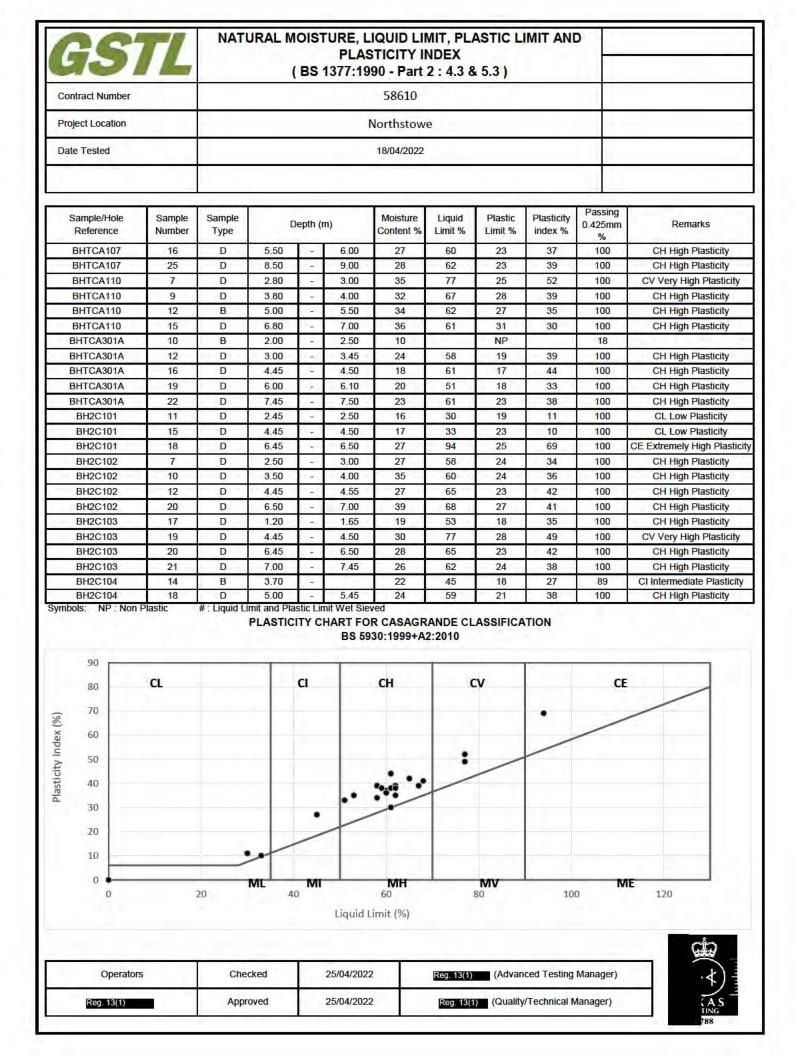
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Operators Reg. 13(1)

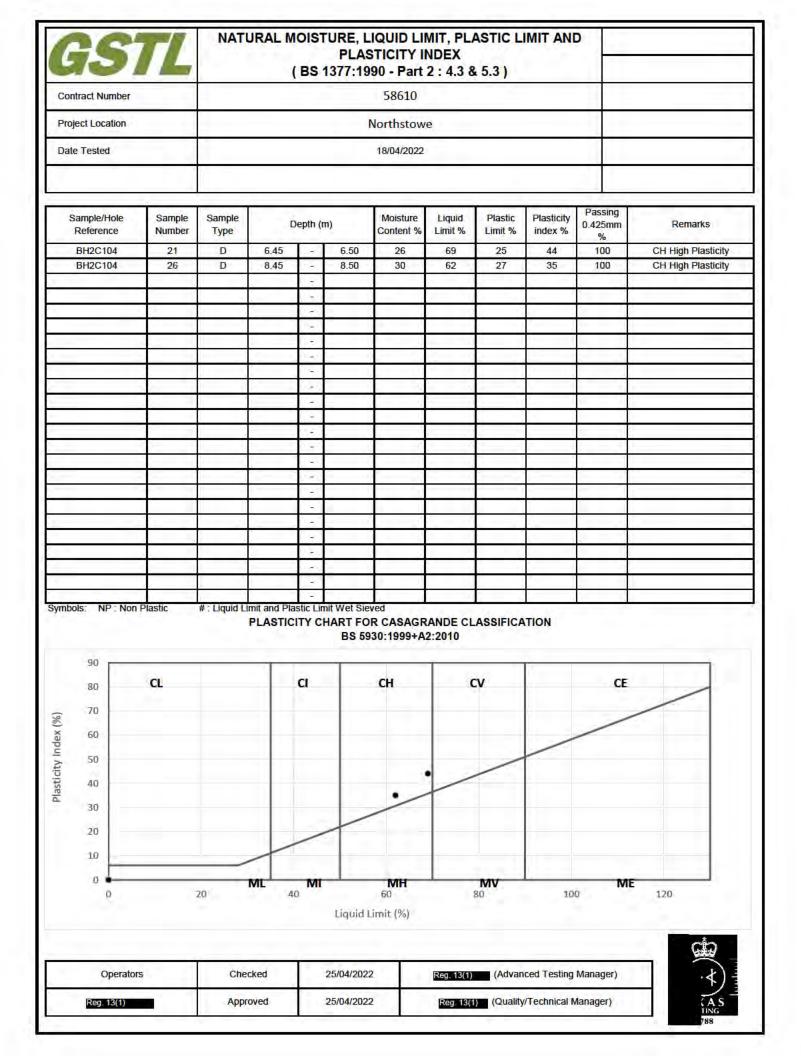
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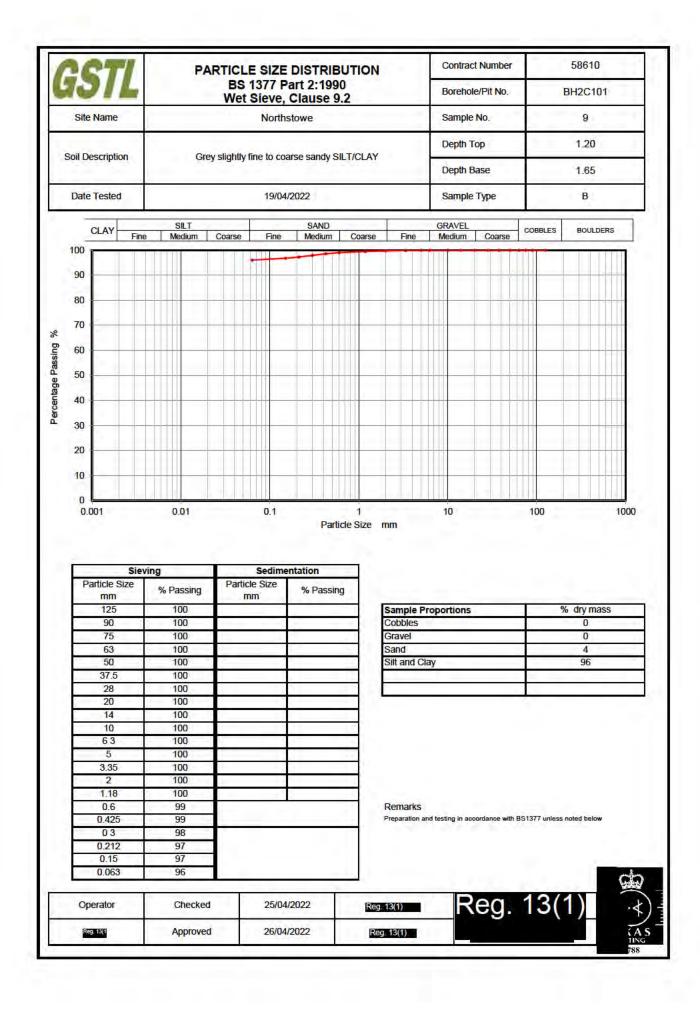
25/04/2022 25/04/2022 Reg. 13(1) (Advanced

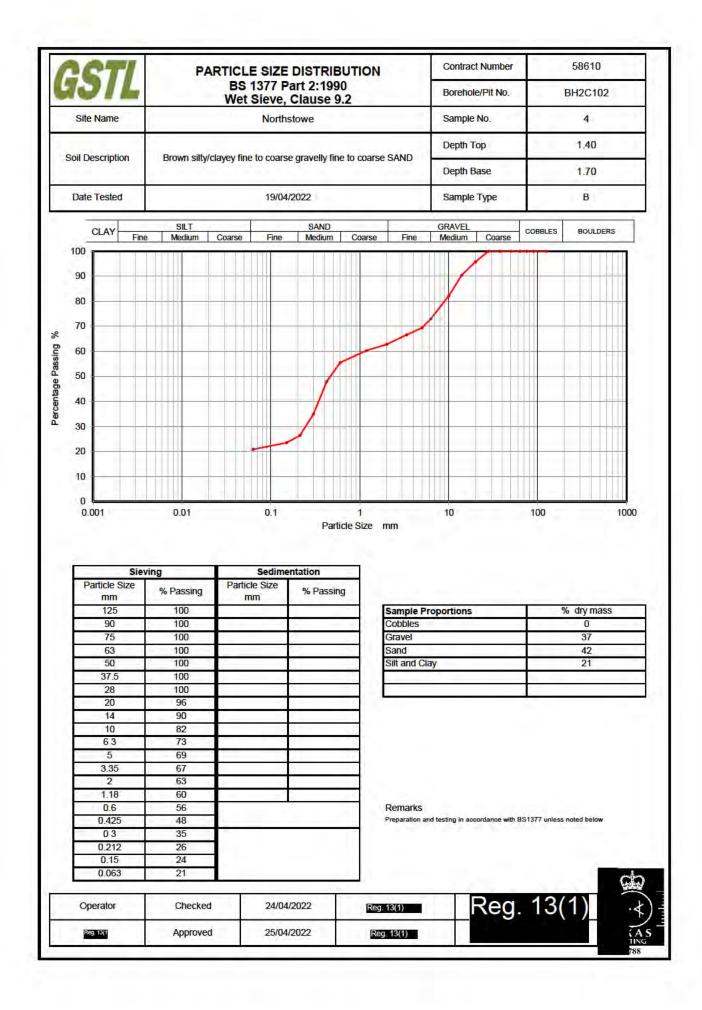
Reg. 13(1) (Quality/Tec

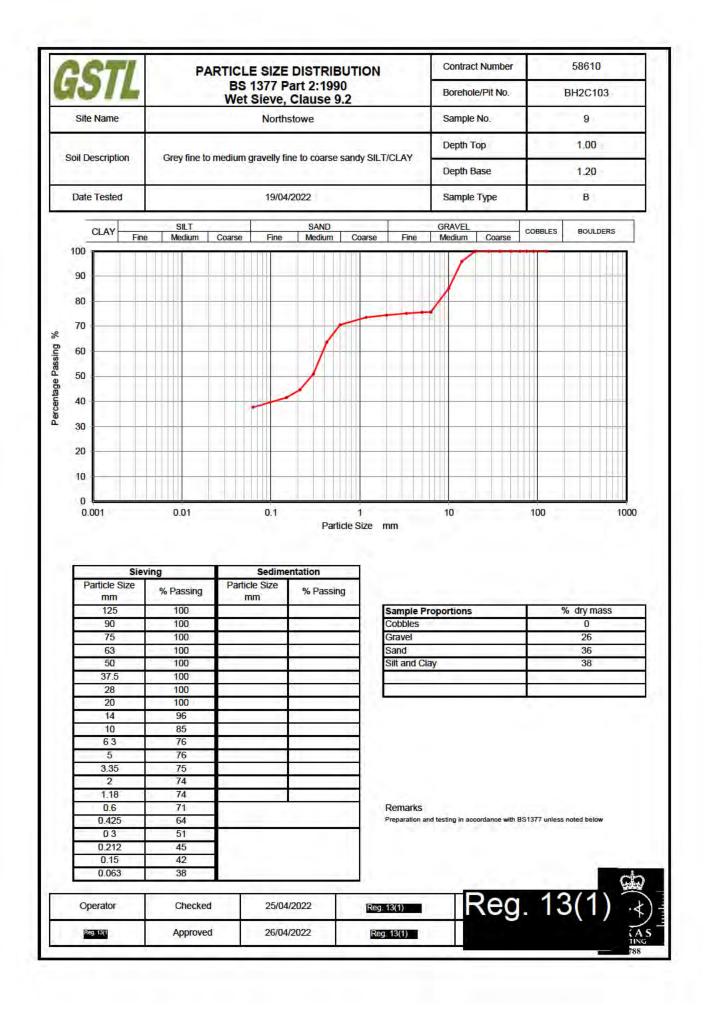


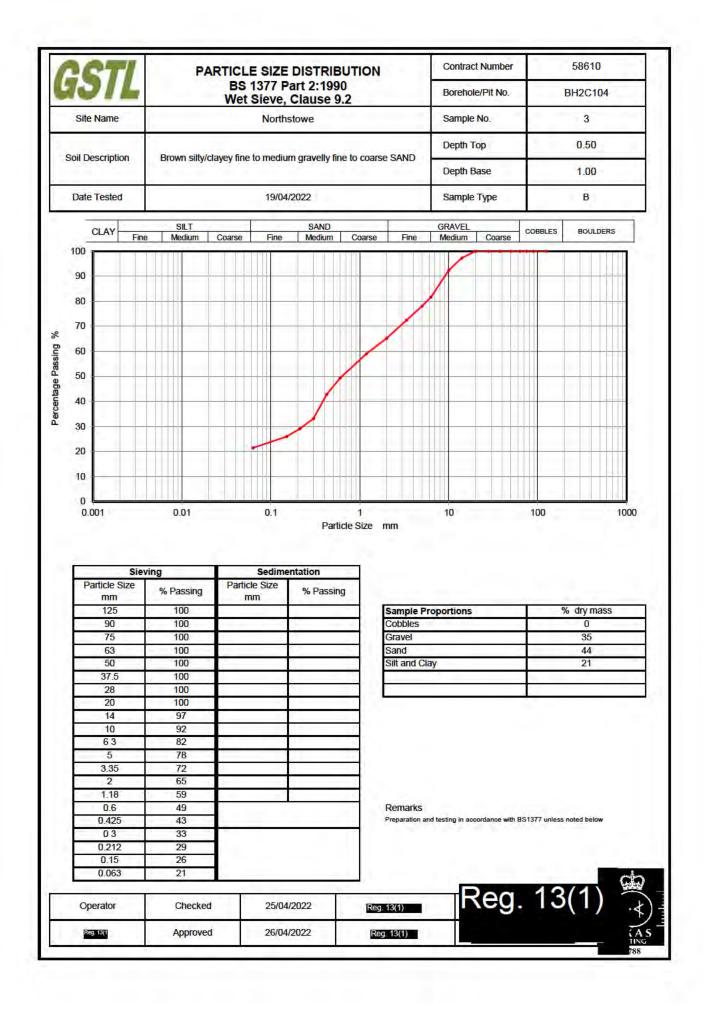
Site Name Northstowe	GS			(	BS		Part 2 : 4.3 & 5.3 )					
18/04/2022         Descriptions         Sample Type       Descriptions         BH2C104       21       D       6.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       6.50       Grey silly CLAY         BH2C104       26       D       8.45       -       8.50       Brown silly CLAY         BH2C104       26       D       -       -       -       -       -         Image: Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspan="4"Colspa="4"Colspa="4"Colspa="4"Colspan="4"Colspan="4"Colspan="4"Colspan=	Contract Number			Northstowe								
DESCRIPTIONS       Sample Reference     Sample Type     Descriptions       BH2C104     21     D     6.45     -     6.50     Grey silly CLAY       BH2C104     26     D     8.45     -     8.50     Brown silly CLAY       BH2C104     26     D     8.45     -     8.50     Brown silly CLAY       BH2C104     26     D     8.45     -     8.50     Brown silly CLAY       H2C104     26     D     8.45     -     8.50     Brown silly CLAY       H2C104     26     D     8.45     -     8.50     Brown silly CLAY       H2C104     26     D     8.45     -     8.50     Brown silly CLAY       H2C104     26     D     -     -     -       H2C104     10     -     - <td< td=""><td>Site Name</td><td></td><td></td><td>206</td><td></td></td<>	Site Name			206								
Sample Reference         Sample Number         Sample Type $Derthore         Descriptions           BH2C104         21         D         6.45         -         6.50         Grey silty CLAY           BH2C104         26         D         8.45         -         8.50         Brown silty CLAY           BH2C104         26         D         8.45         -         8.50         Brown silty CLAY           Control         1         C         2         D         6.45         -         8.50           BH2C104         26         D         8.45         -         8.50         Brown silty CLAY           Control         1         C         Sample         -         Control         Control           Control         1         C         C         Control         Control         Control           Control         1         Control         Control         Control         Control         Control           Control         1         Control         Control         Control         Control         Control           Control         1         Control         Control         Control         Control         Control           Control         1    $	Date Tested											
Reference         Number         Type         Description           BH2C104         21         D $6.45$ - $6.50$ Grey sity CLAY           BH2C104         28         D $8.45$ - $8.50$ Brown sity CLAY           BH2C104         28         D $8.45$ - $8.50$ Brown sity CLAY           BH2C104         28         D $8.45$ - $8.50$ Brown sity CLAY           BH2C104         28         D $8.45$ - $8.50$ Brown sity CLAY           Image: Second						DESCRI	PTIONS					
BH2C104         26         D         8.45         -         8.50         Brown silty CLAY           Image: Second Se				D	epth (n	1)	Descriptions					
					-							
	BH2C104	26	D	8.45		8.50	Brown silty CLAY					
					+ +							
					1							
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				_	+ +							
				_								
				_								
				_	0.50							
				_	-			_				
	_				-							
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					+ +	_						
	Operator	s	Chec	ked		25/04/2022	Reg. 13(1) (Advanced Testing Manager)					

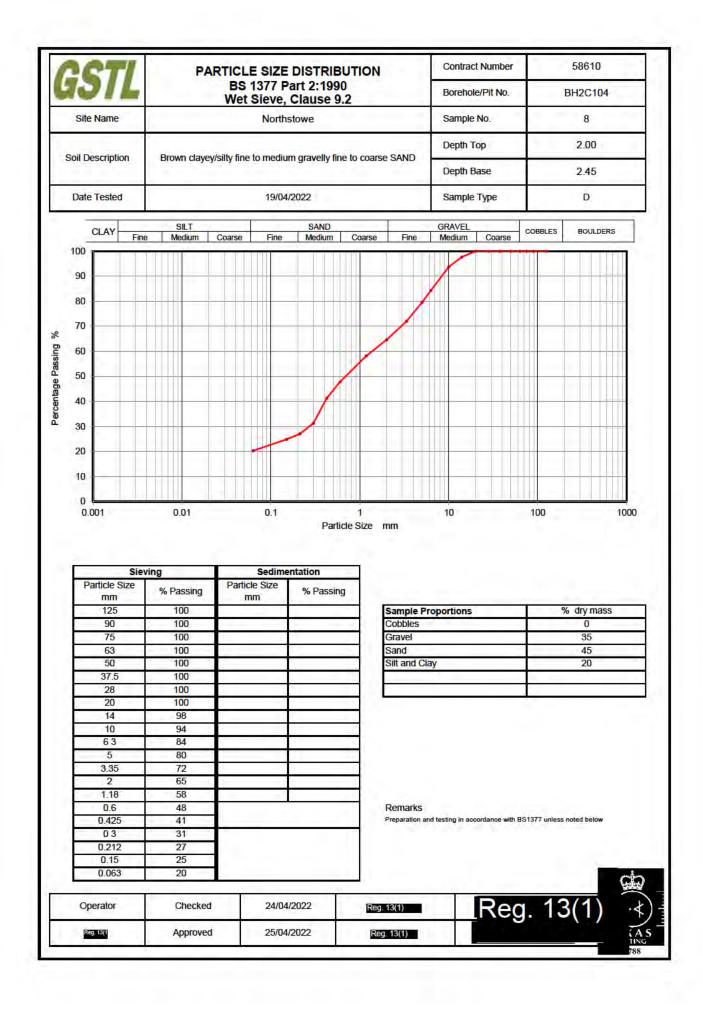


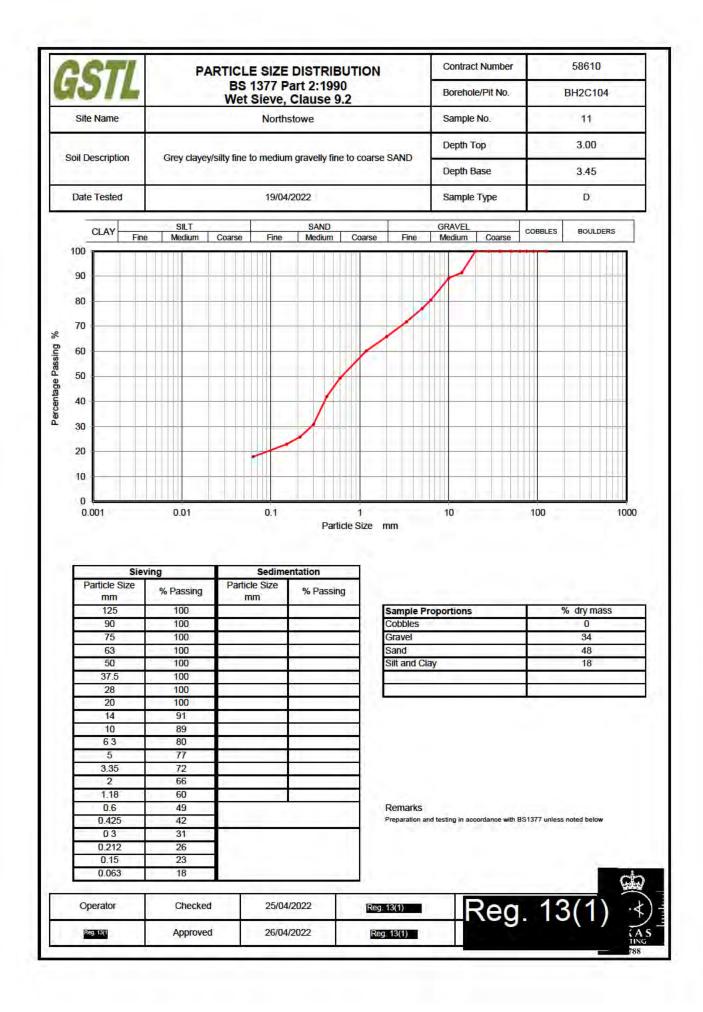


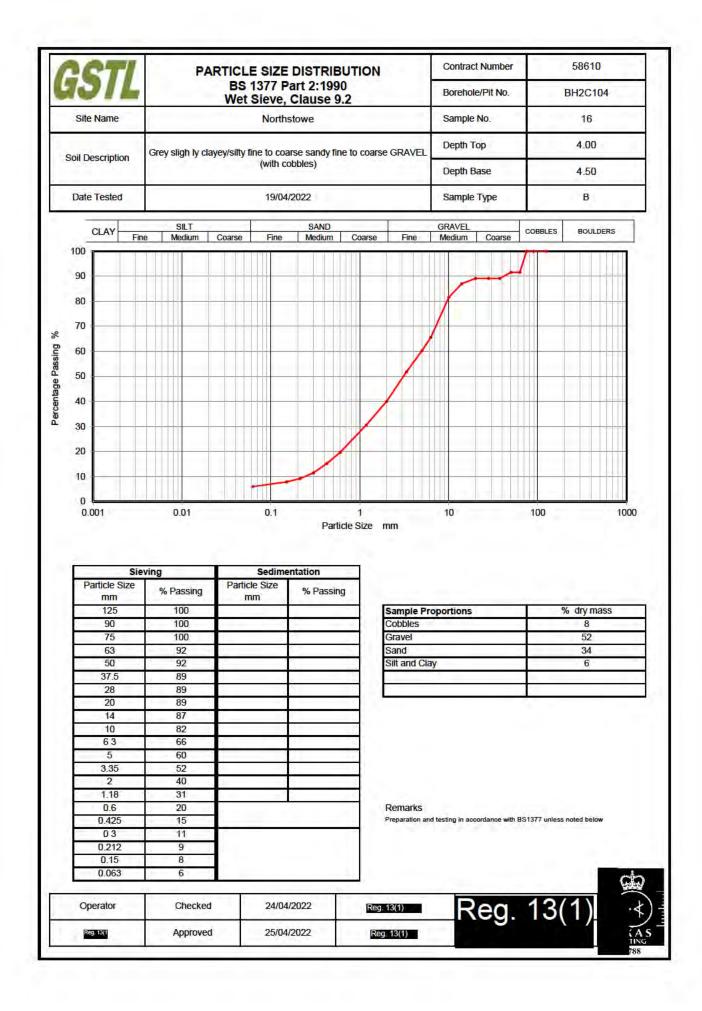


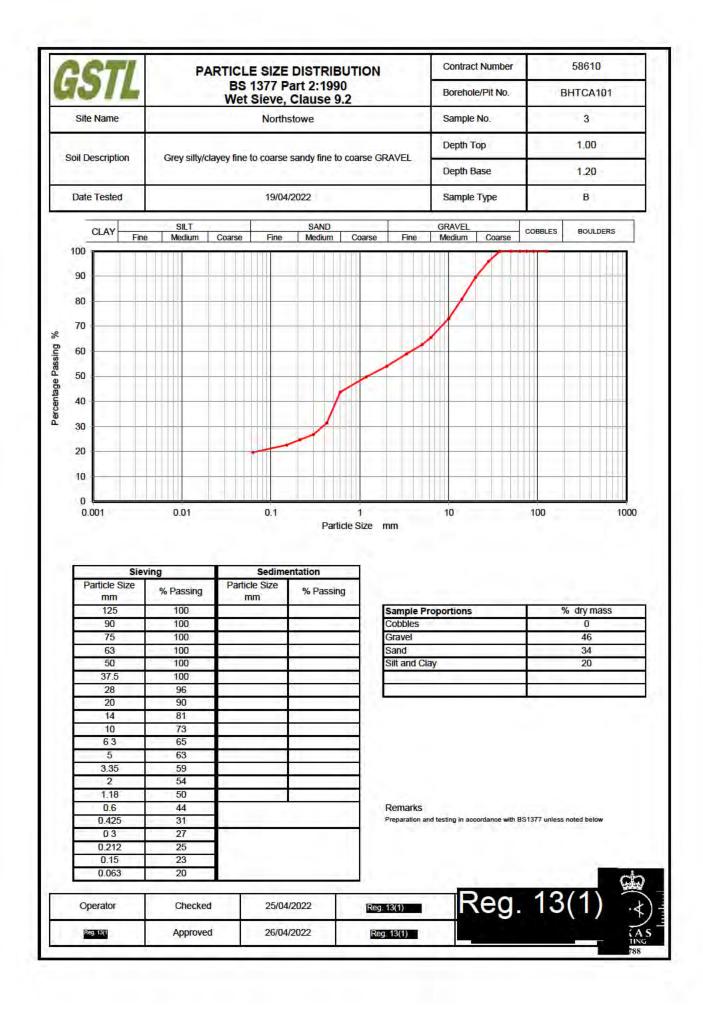


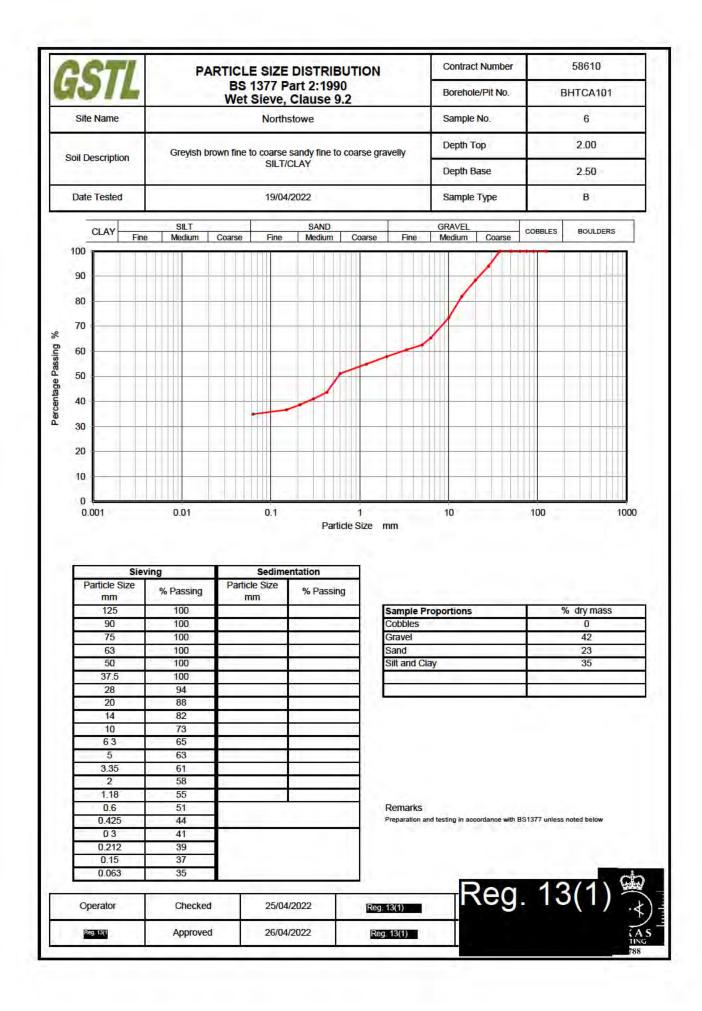


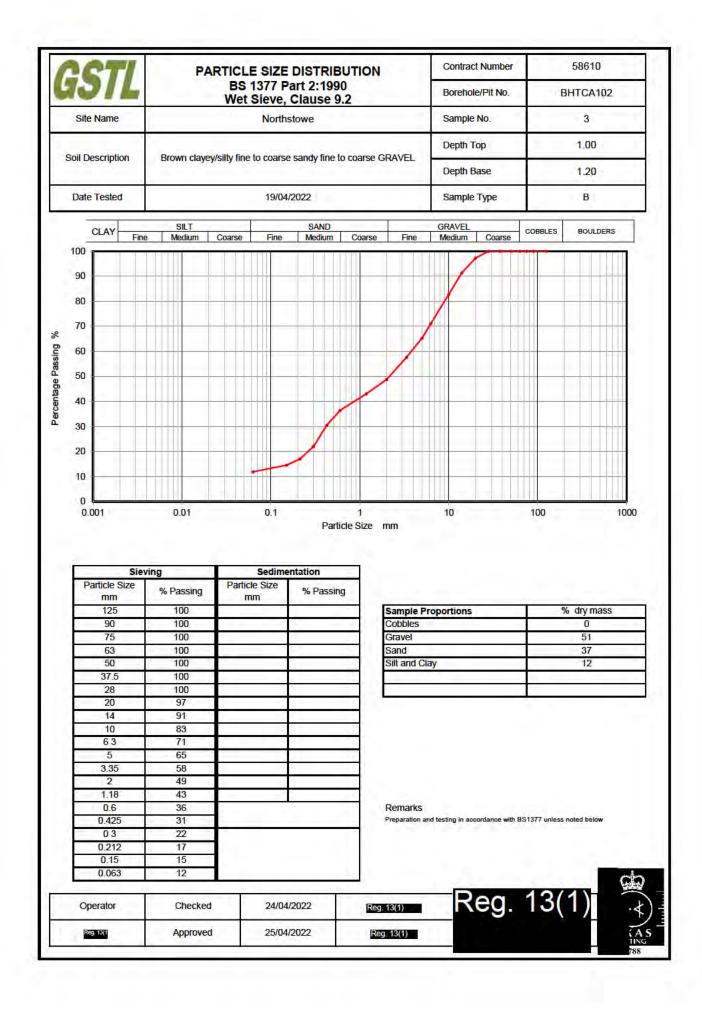


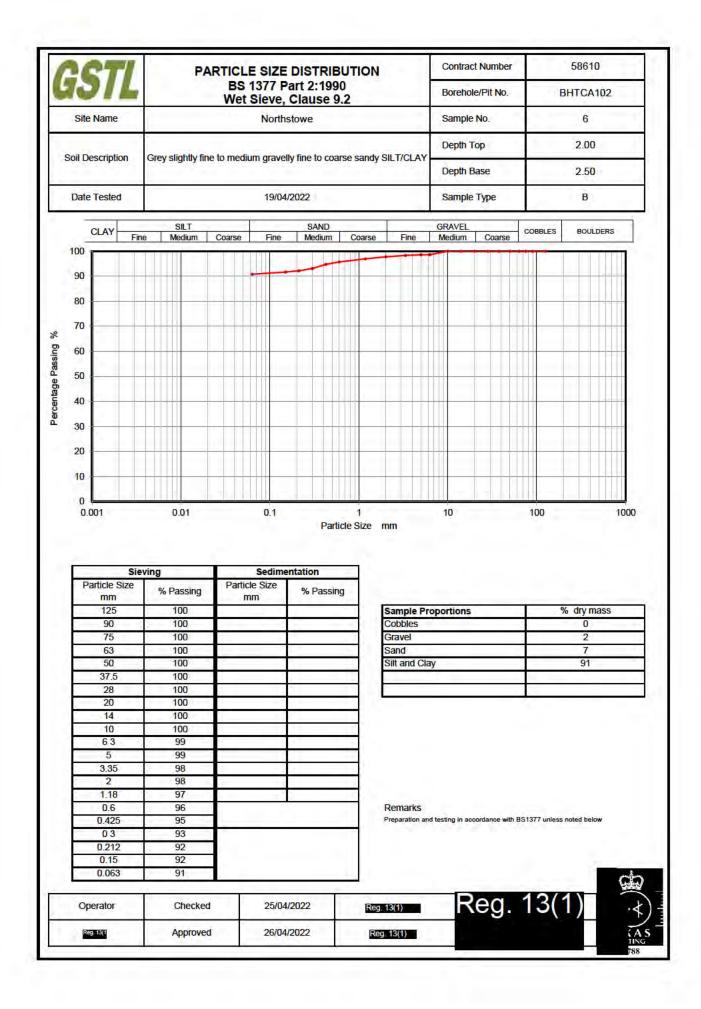


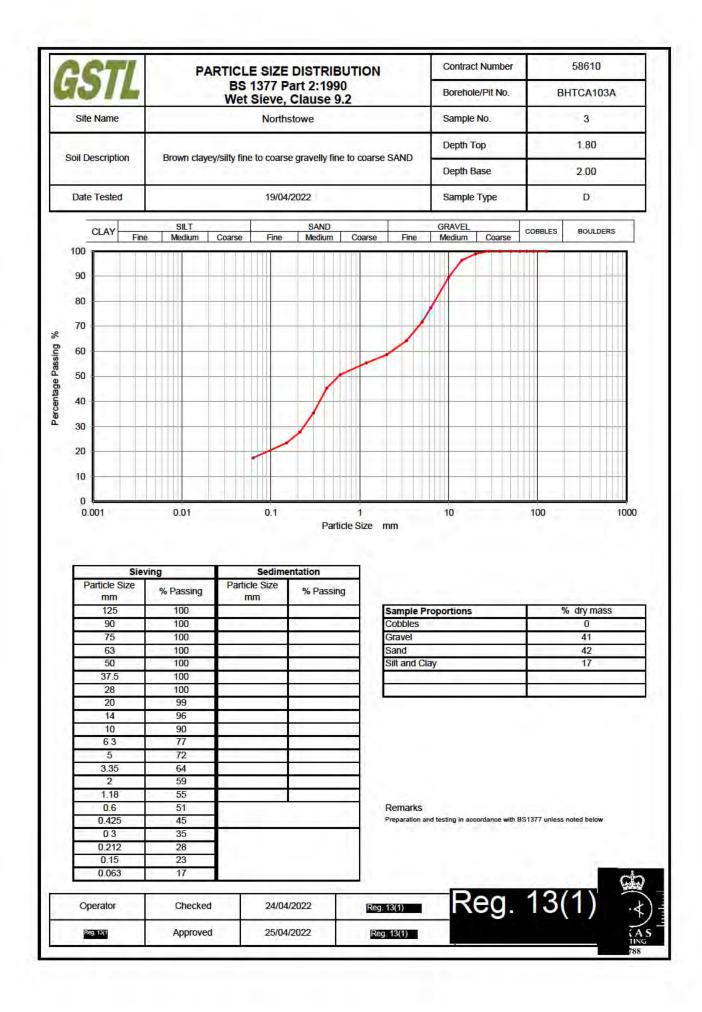


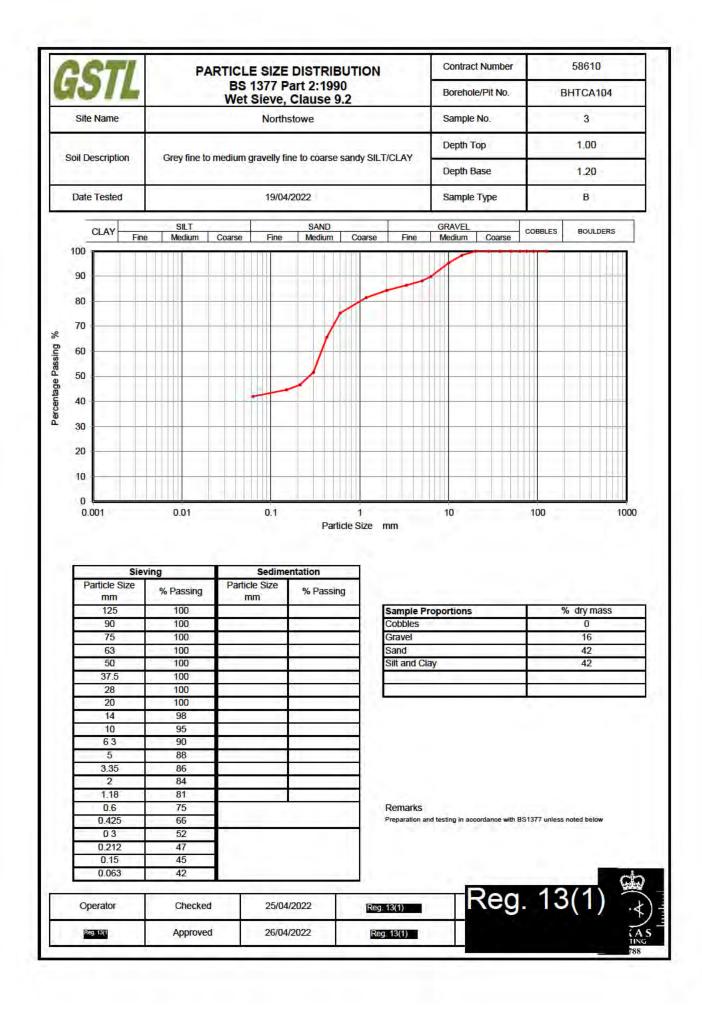


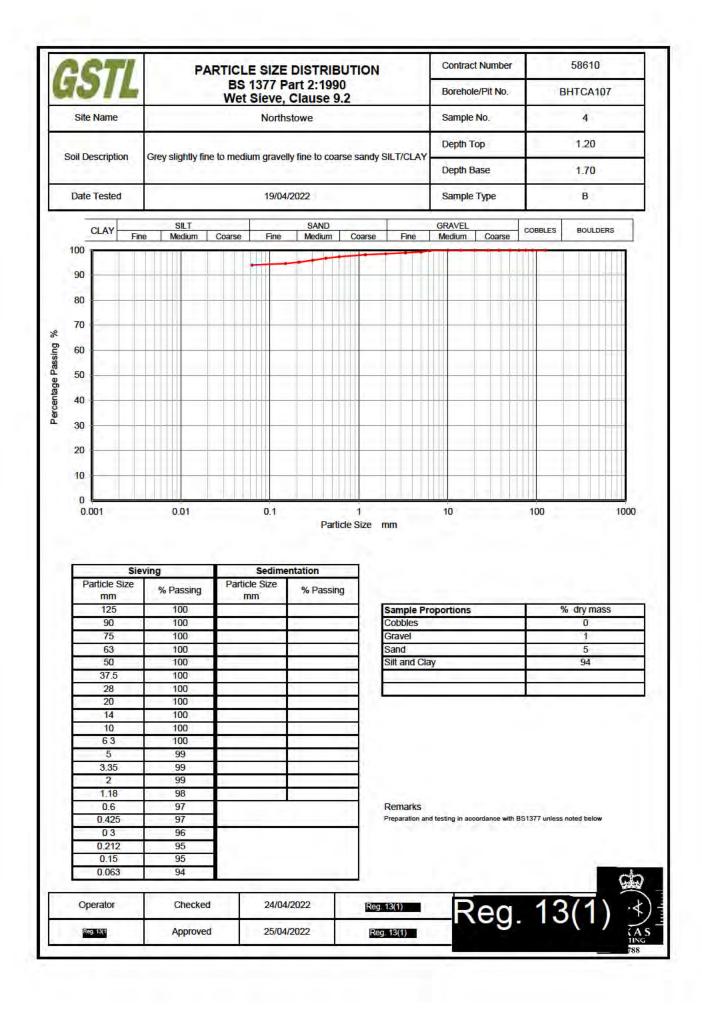


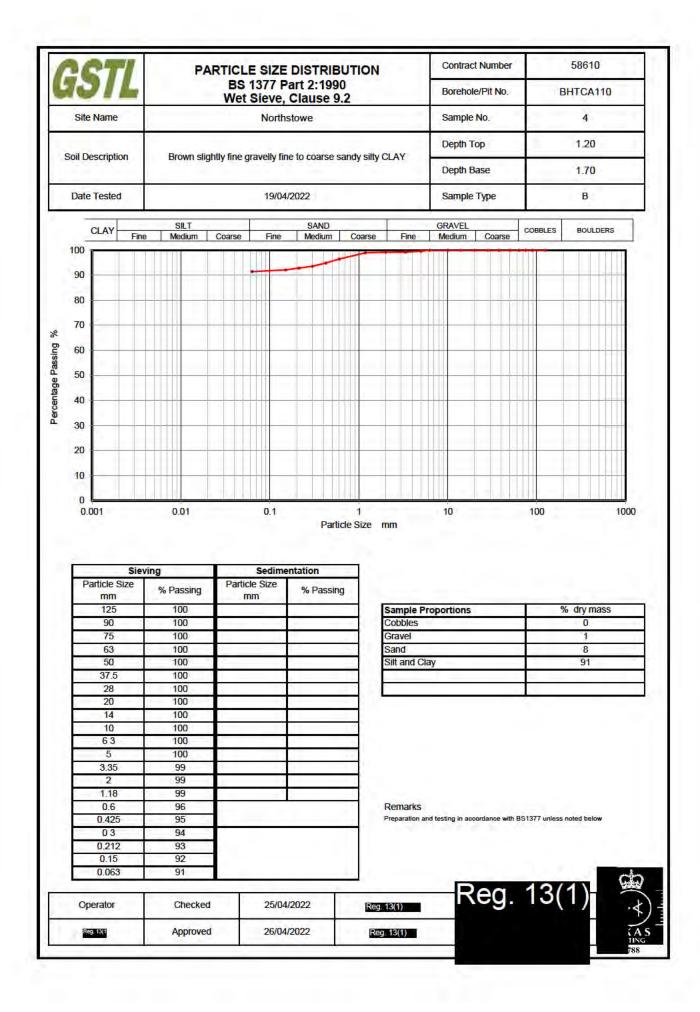


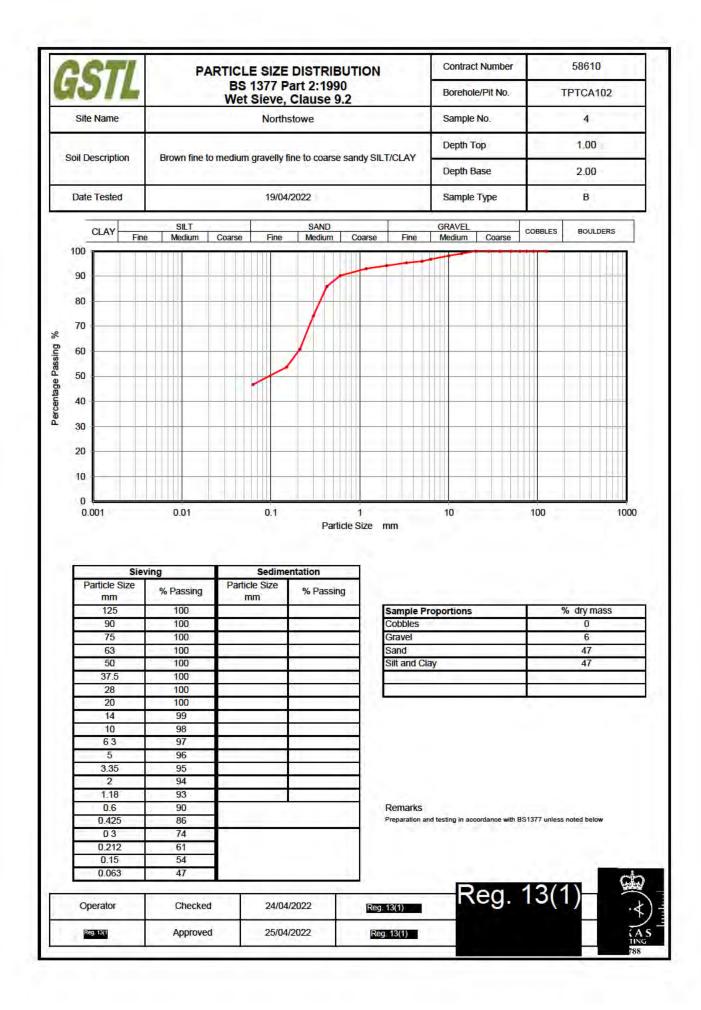


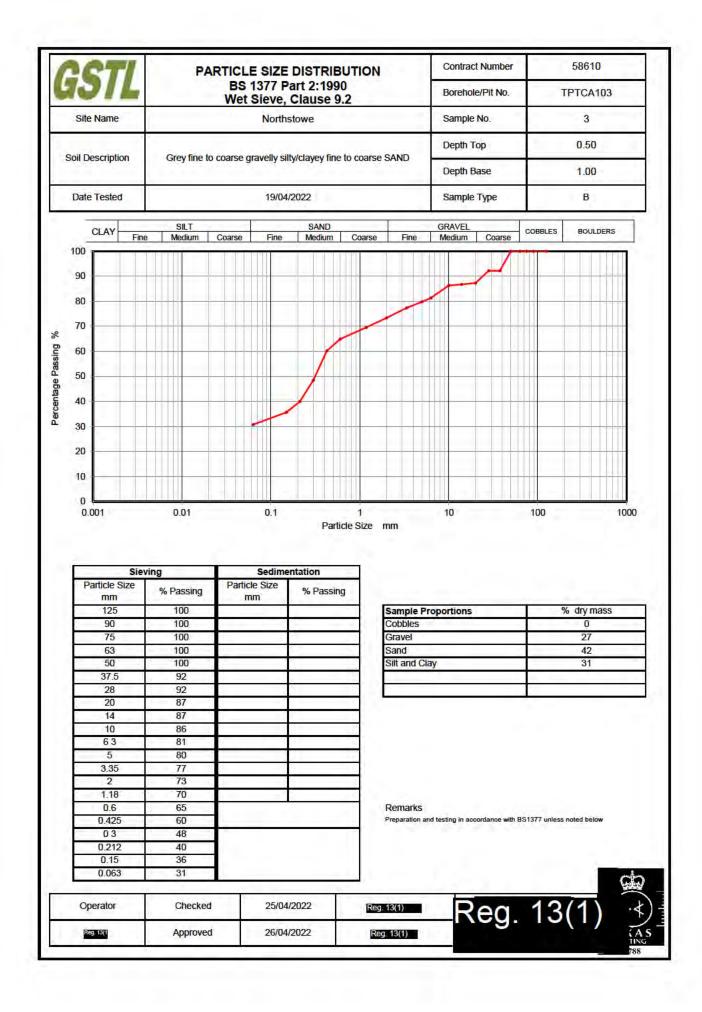


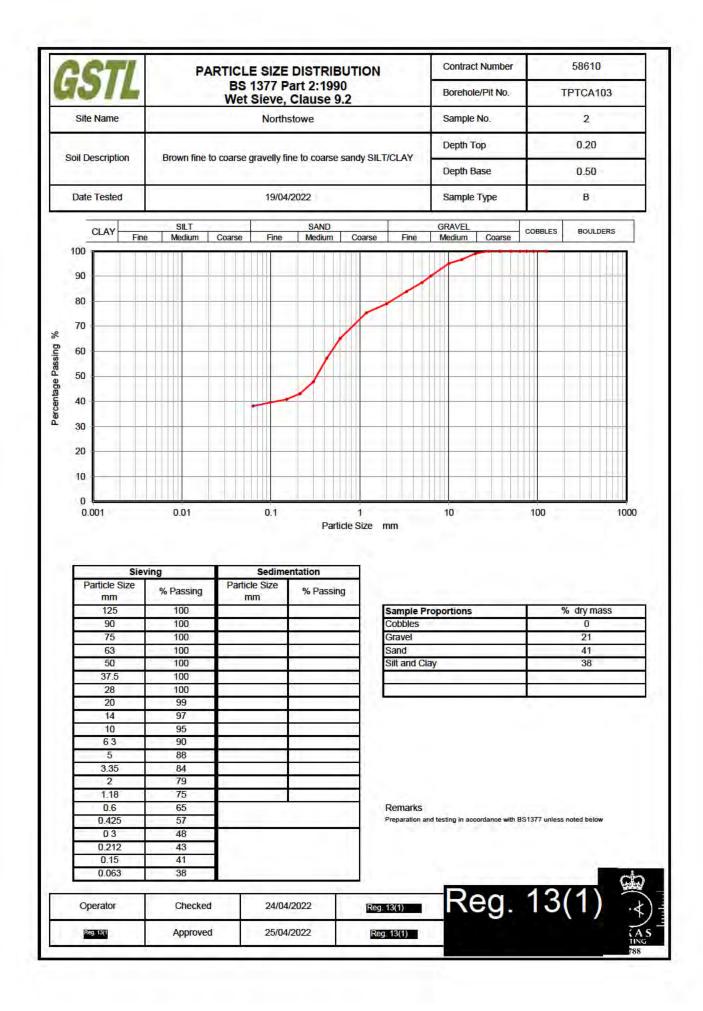


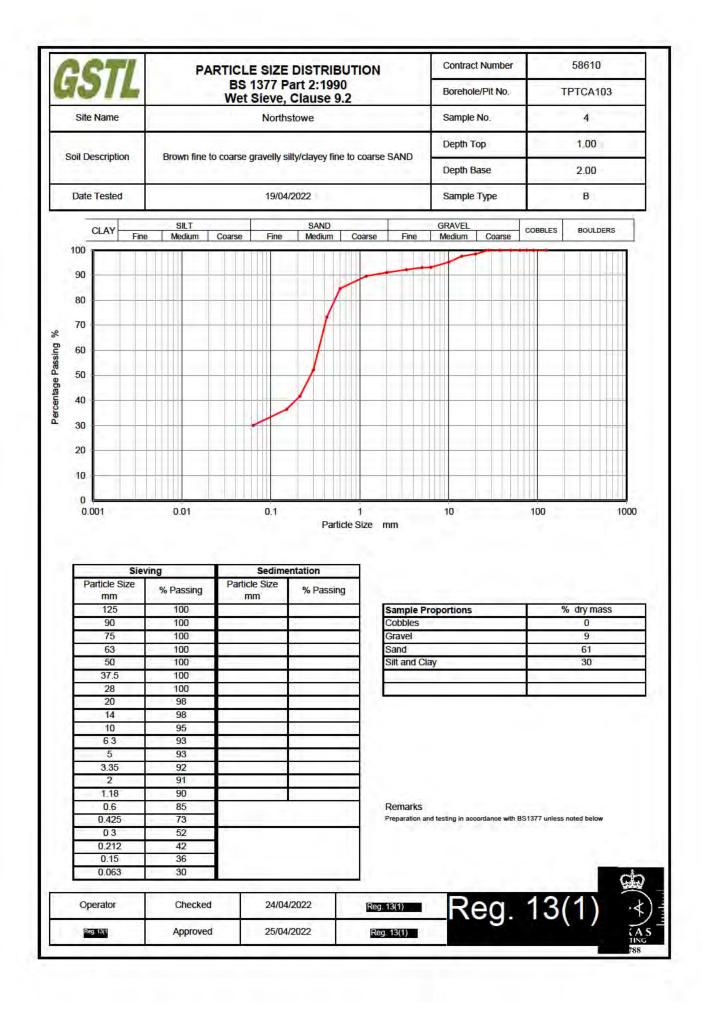


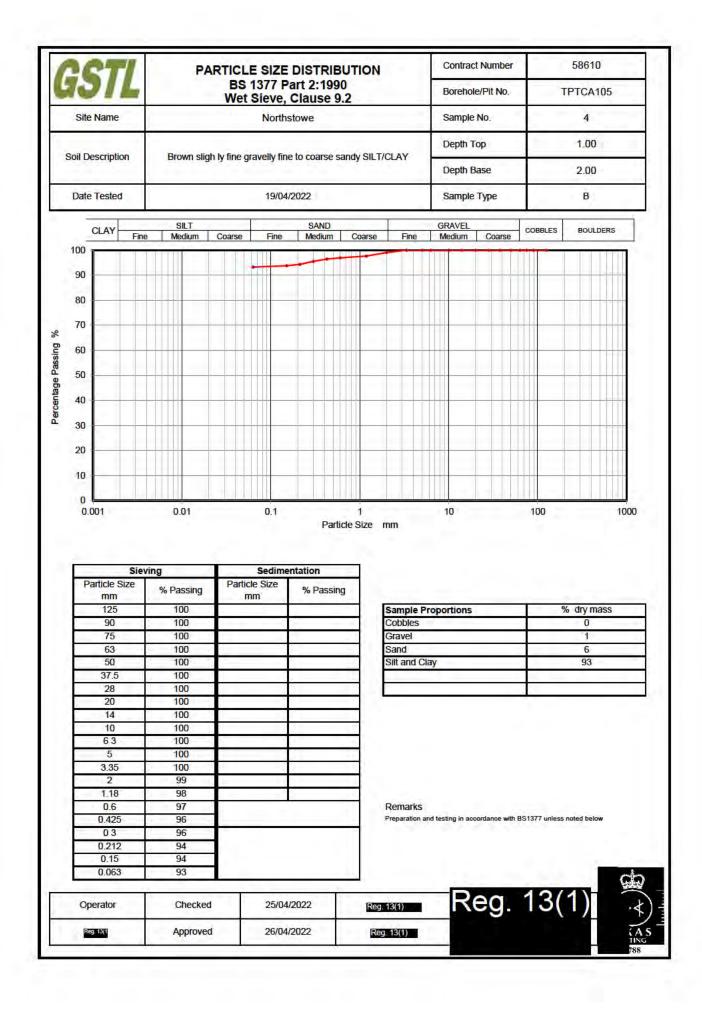


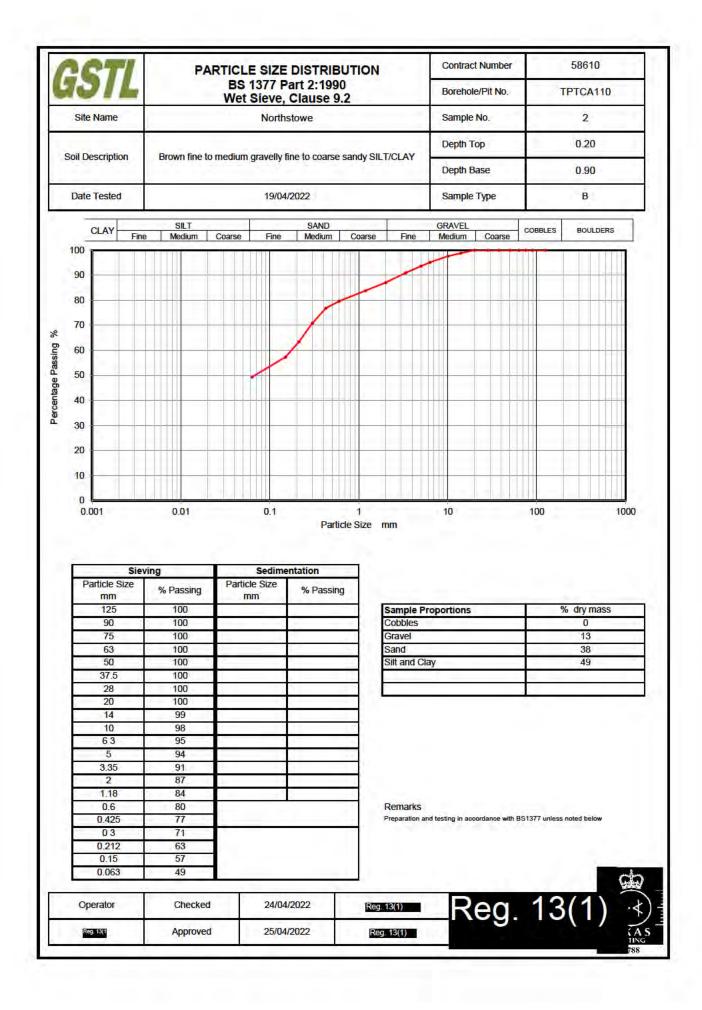


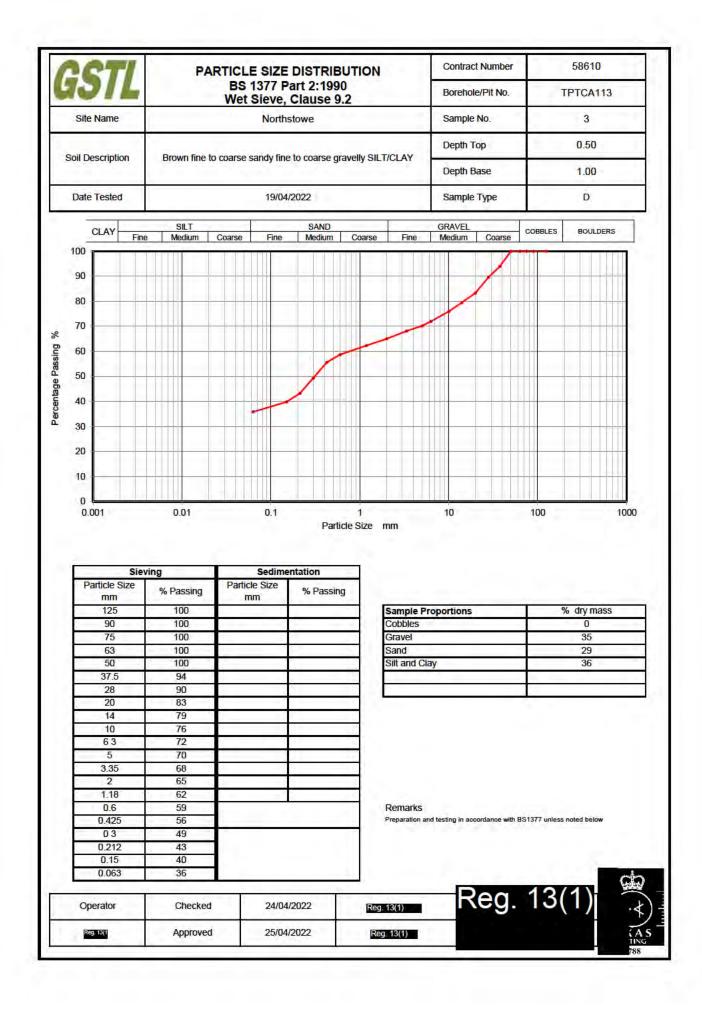


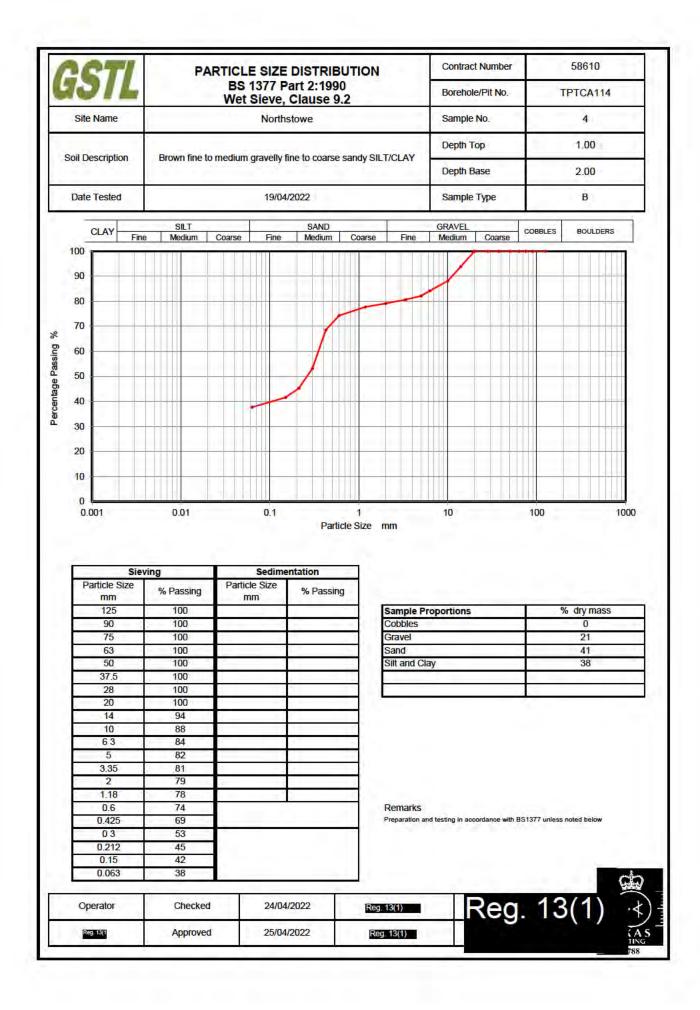


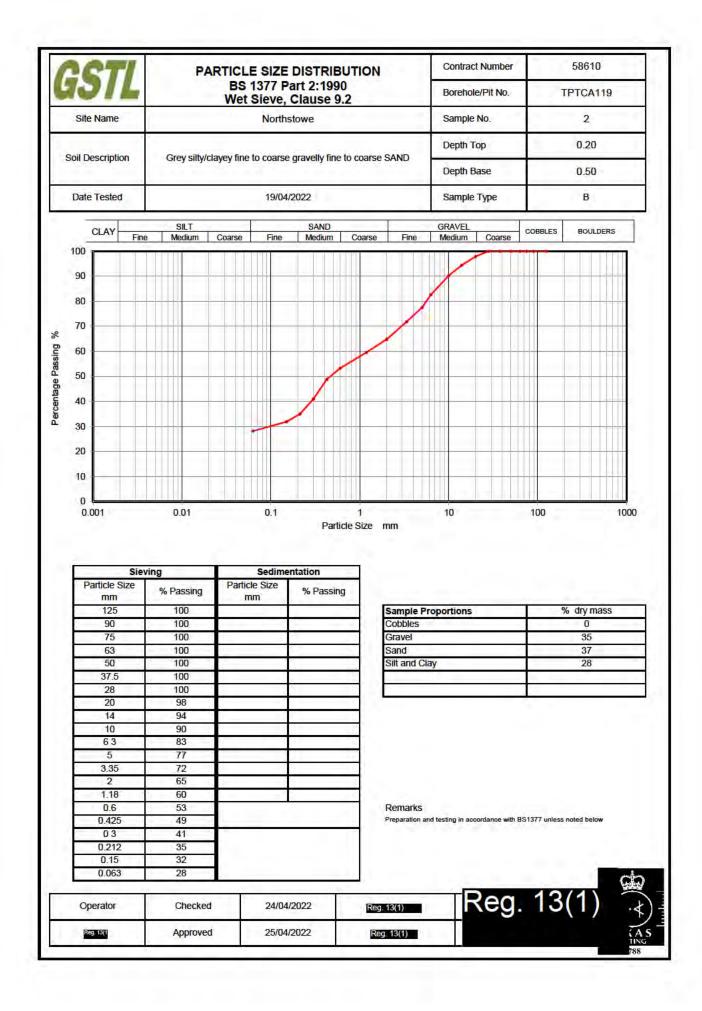


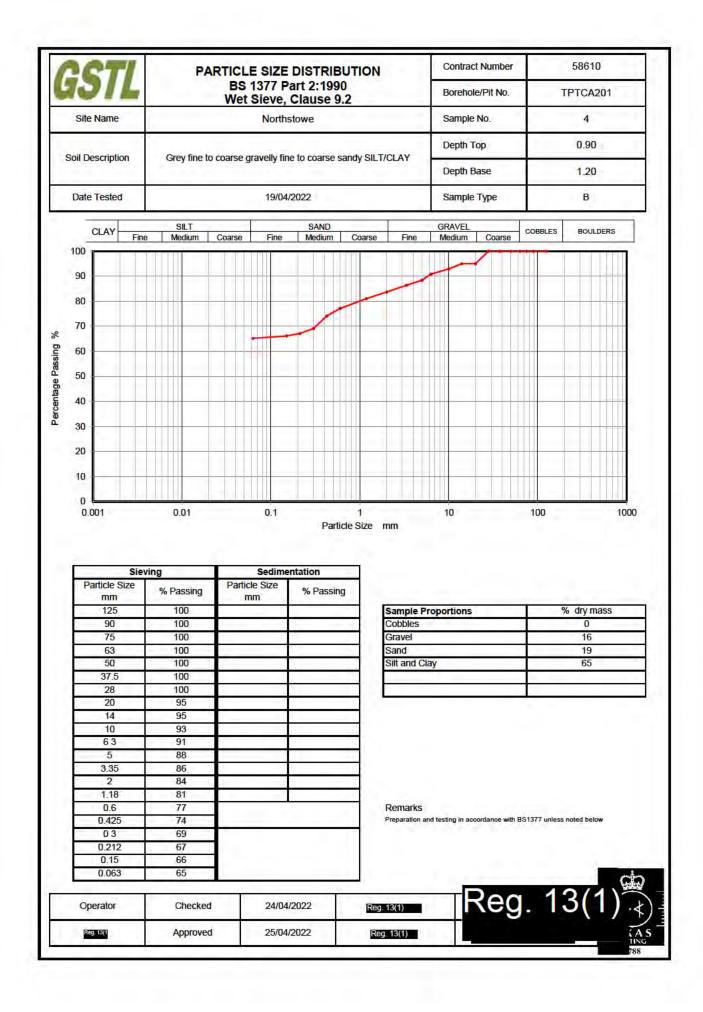


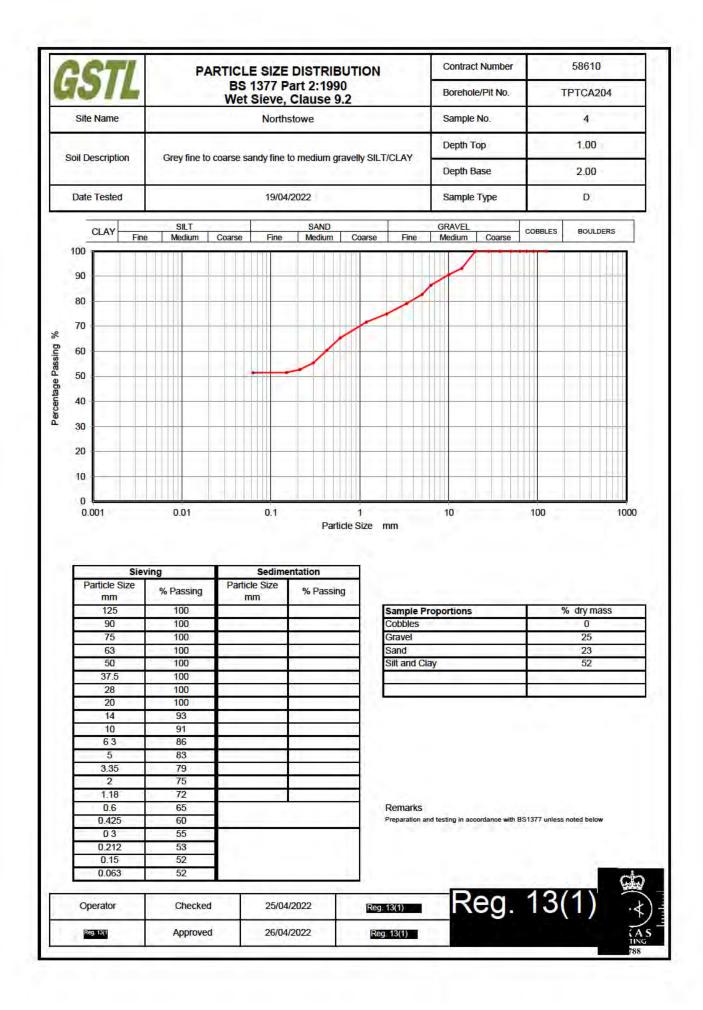


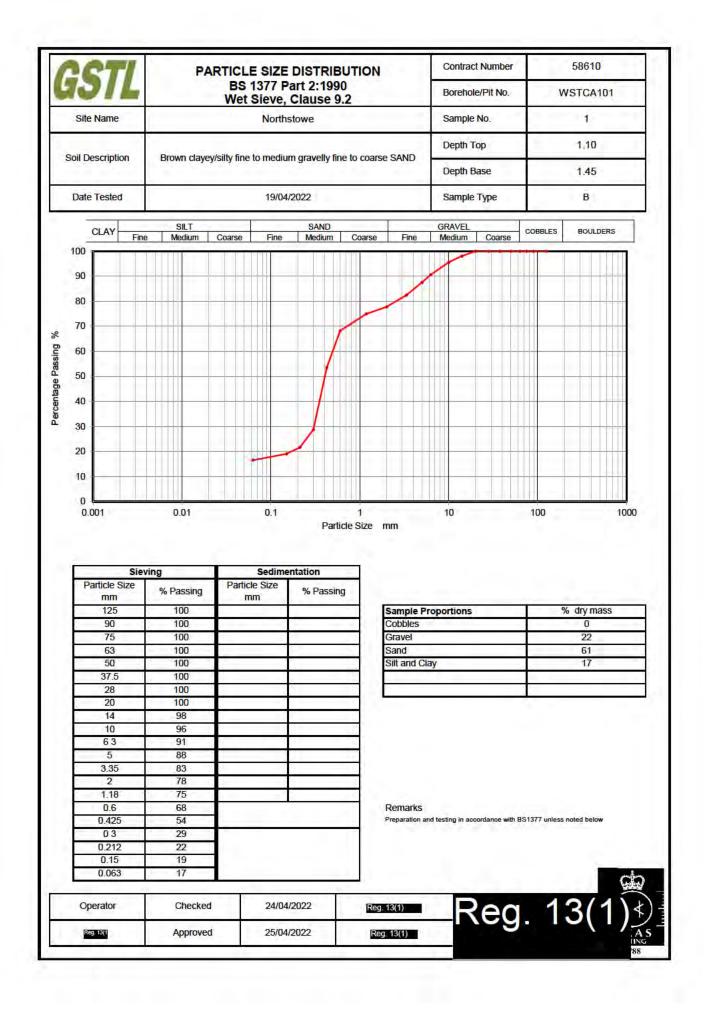


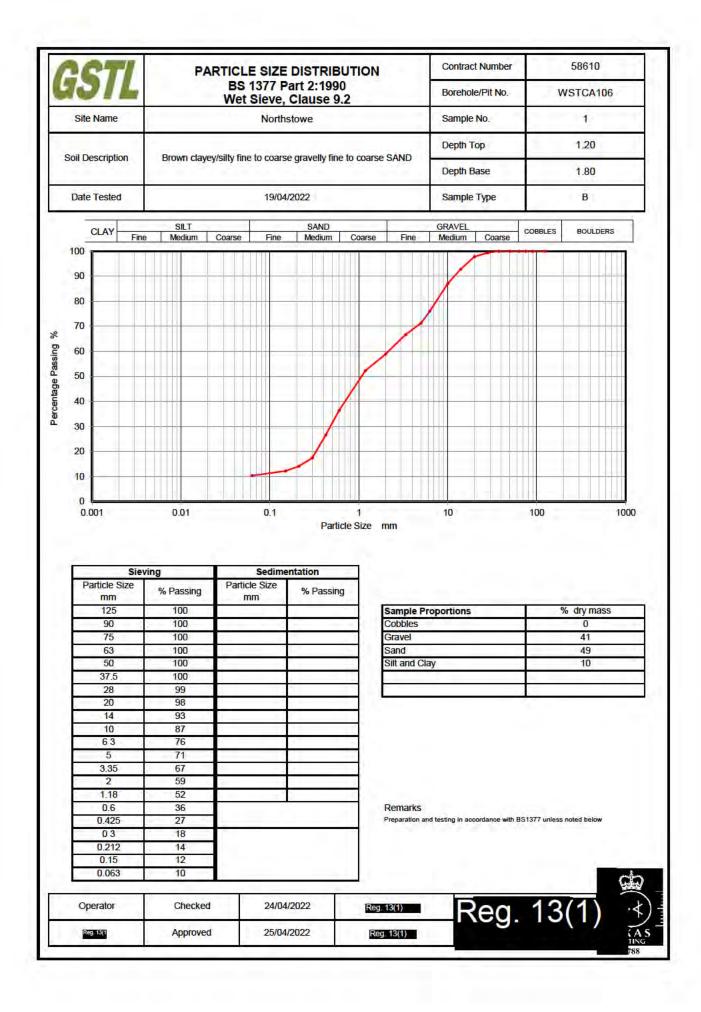


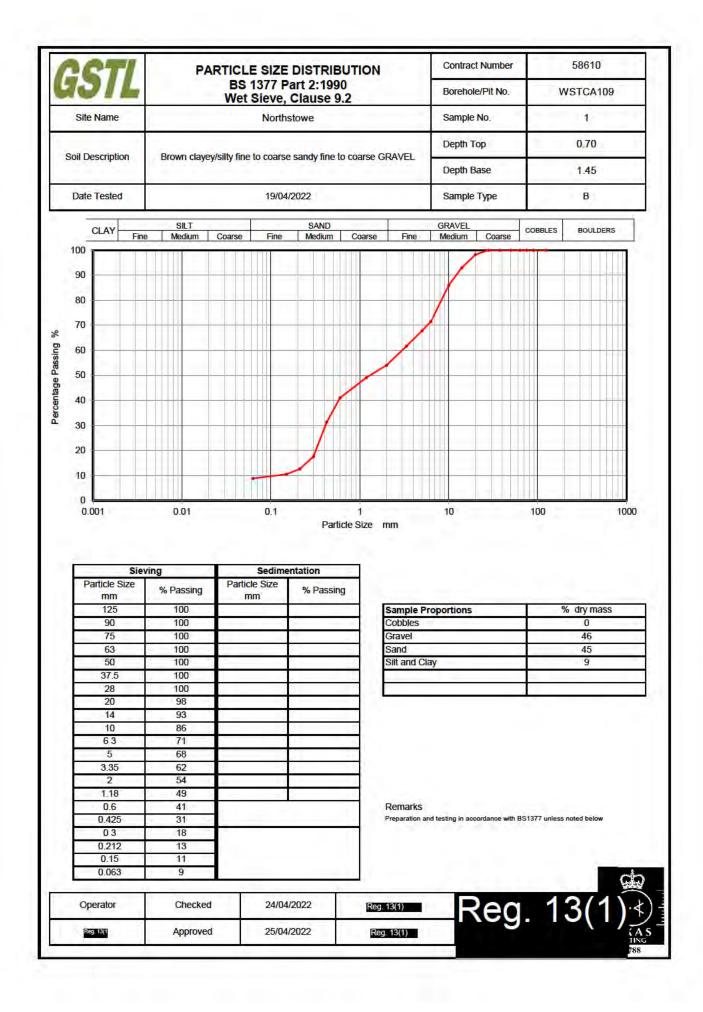


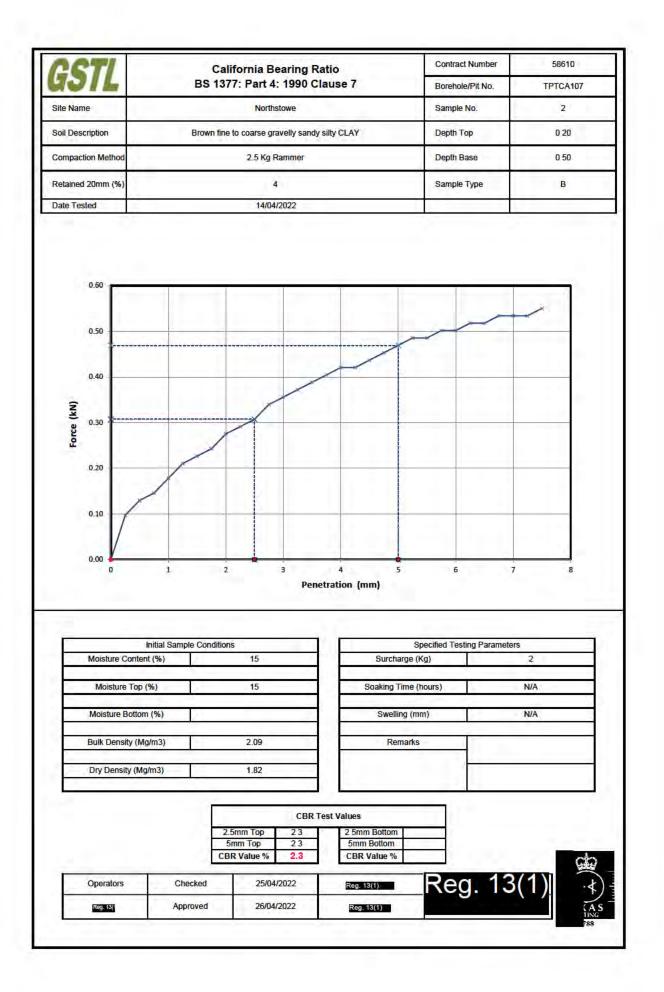


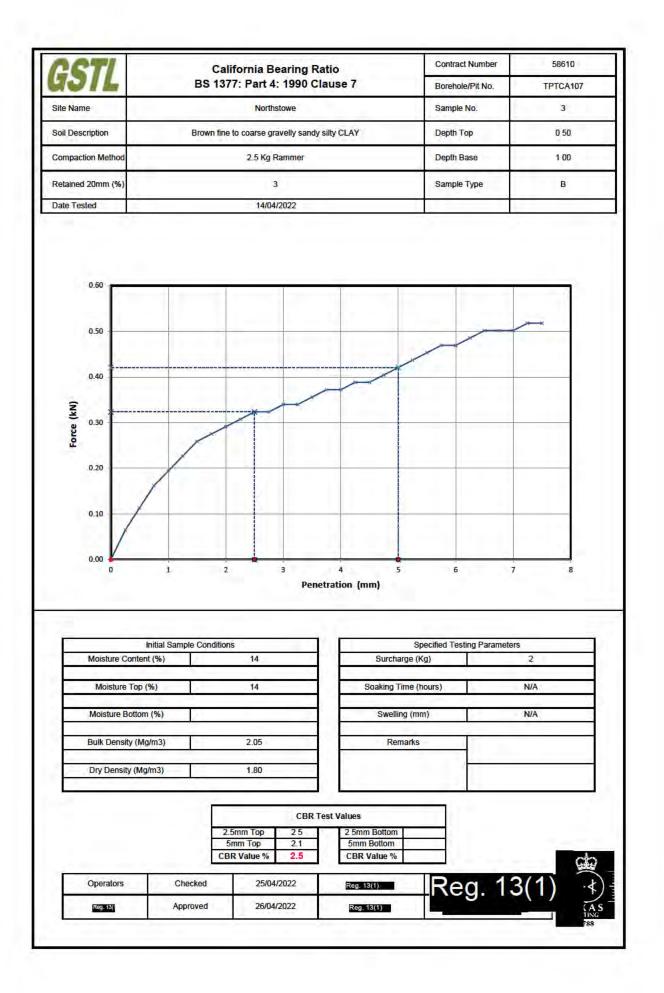


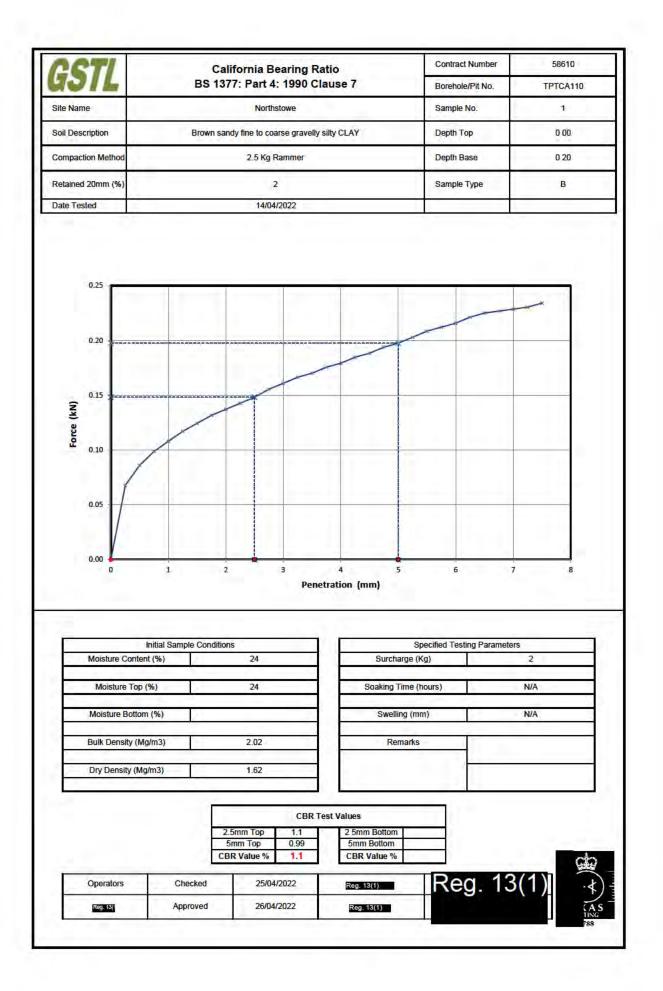


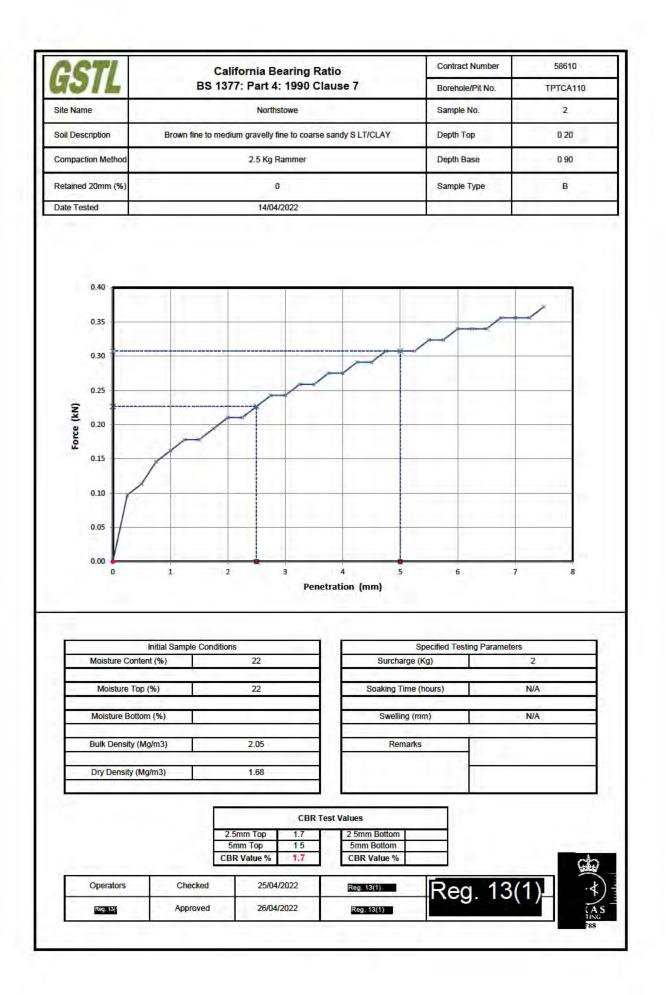


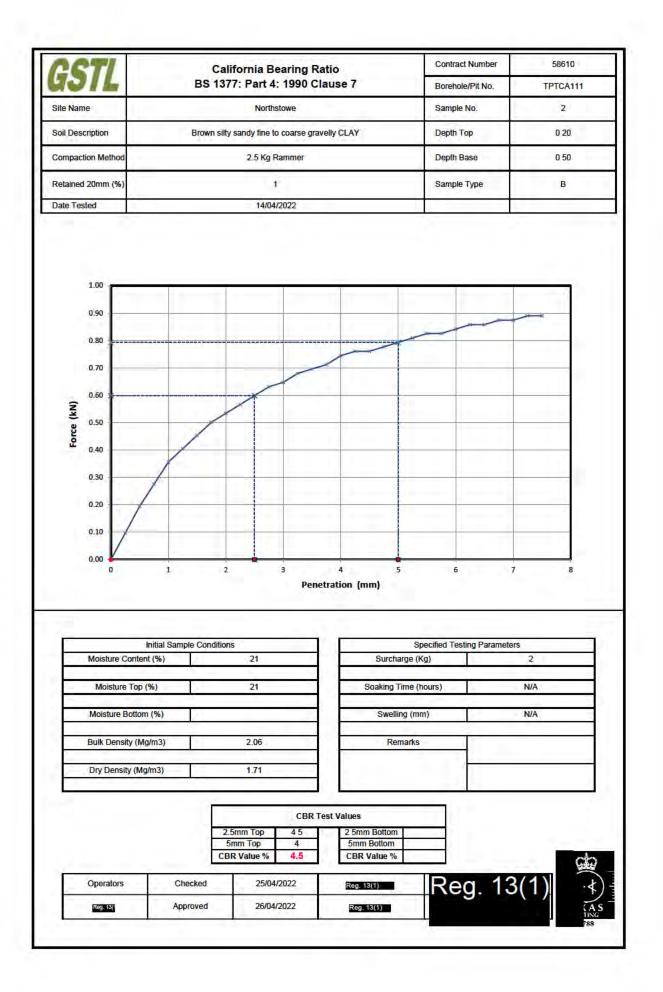


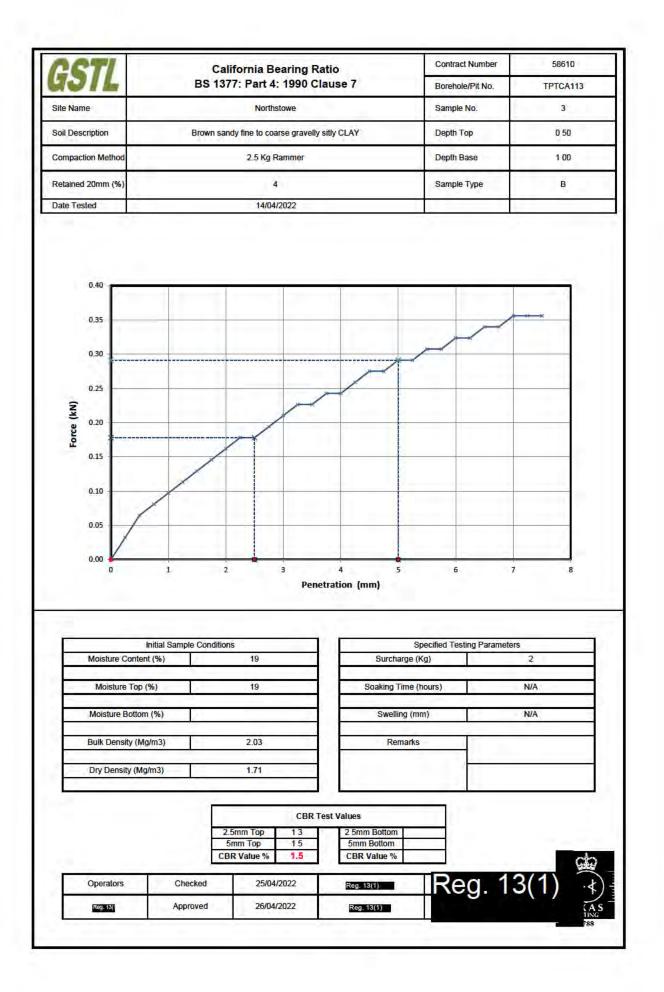


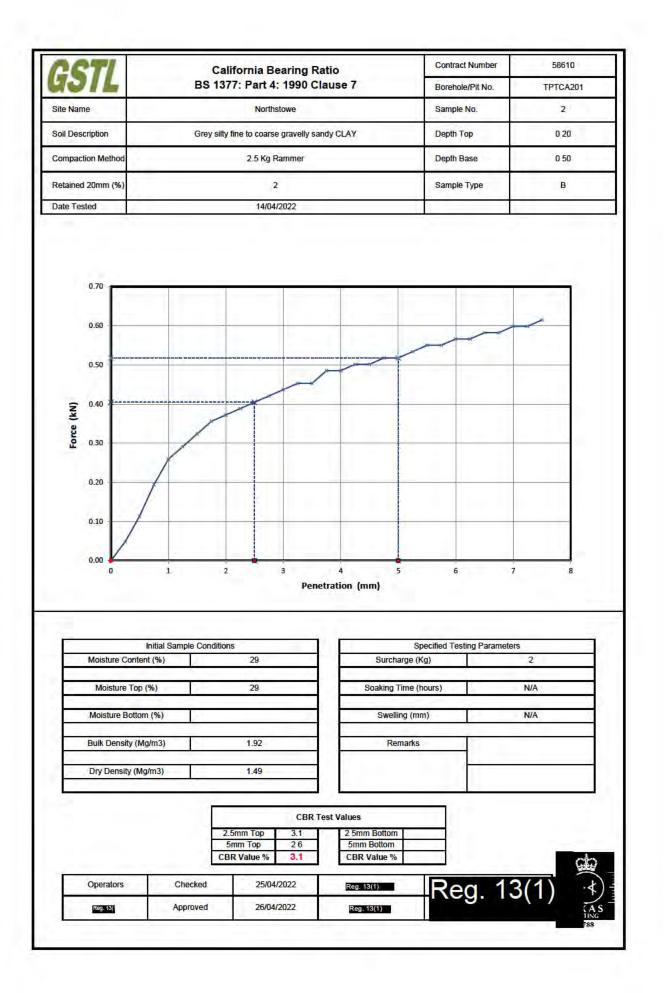


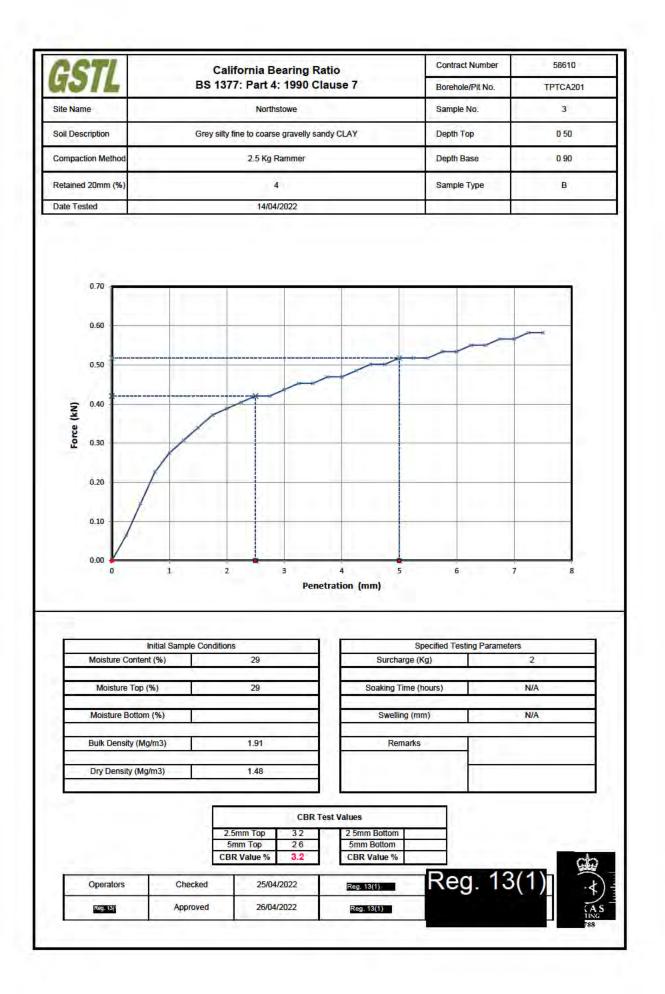


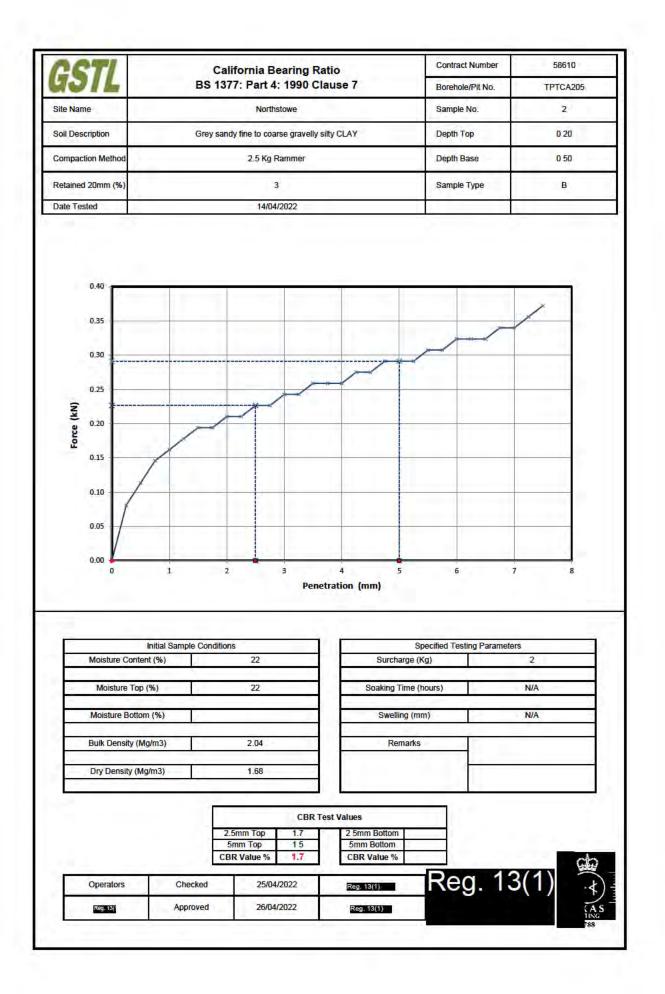


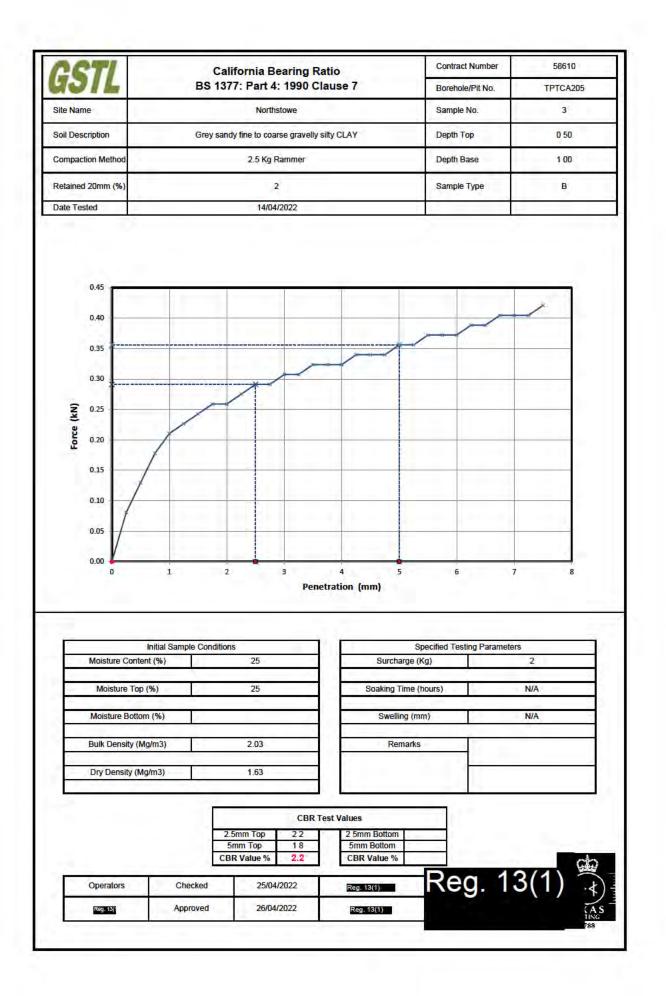


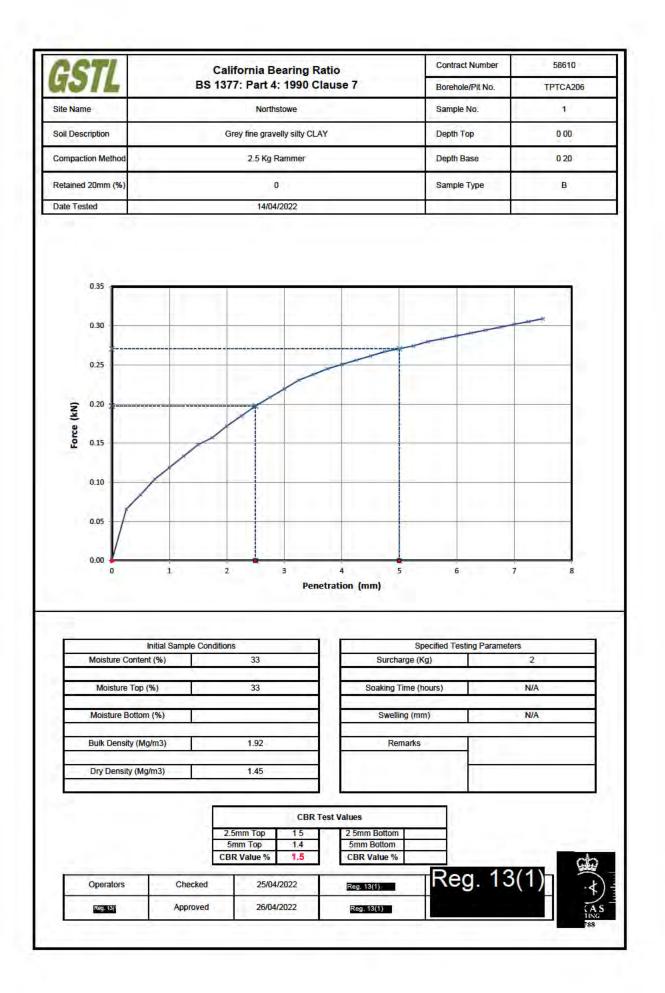


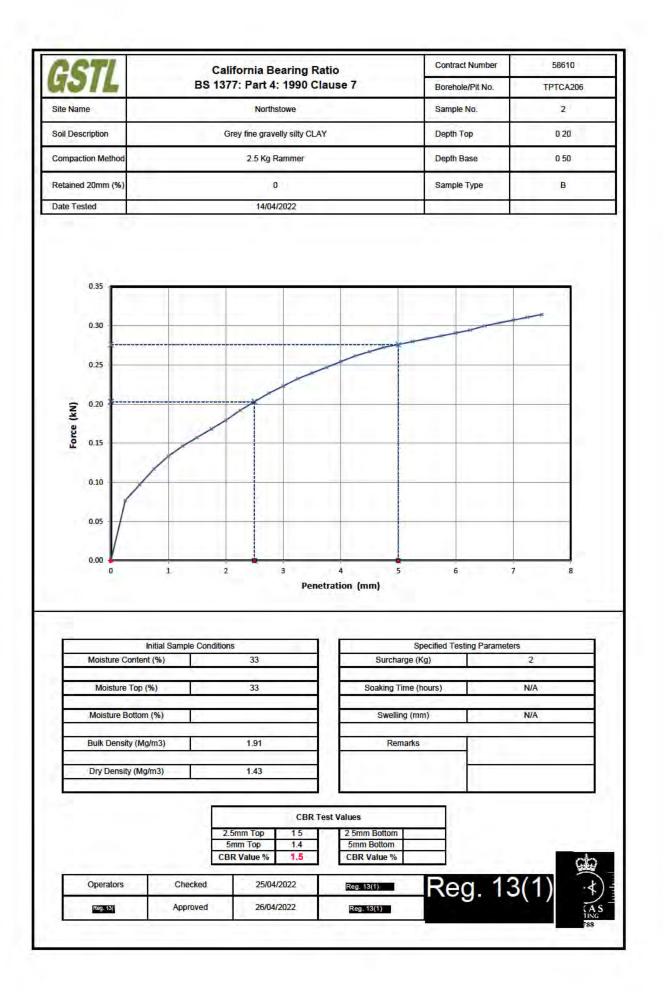


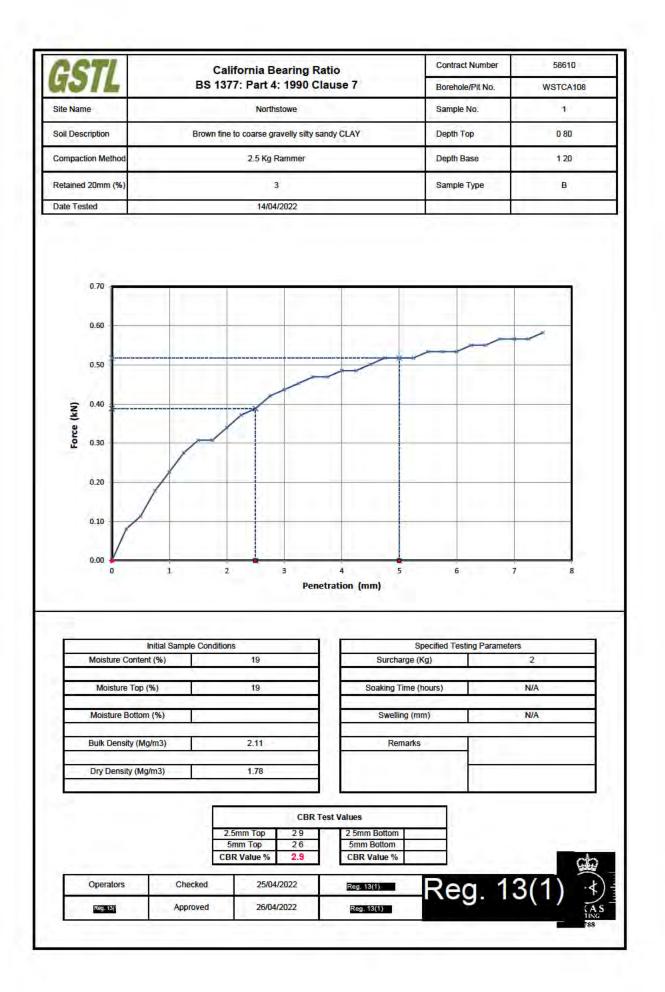


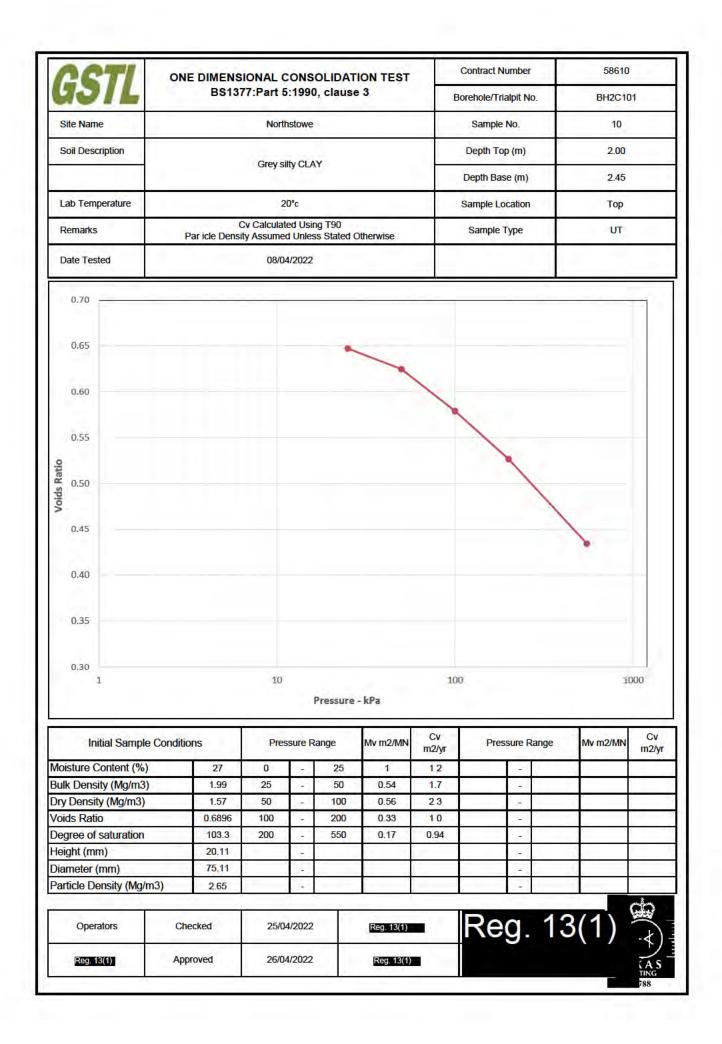


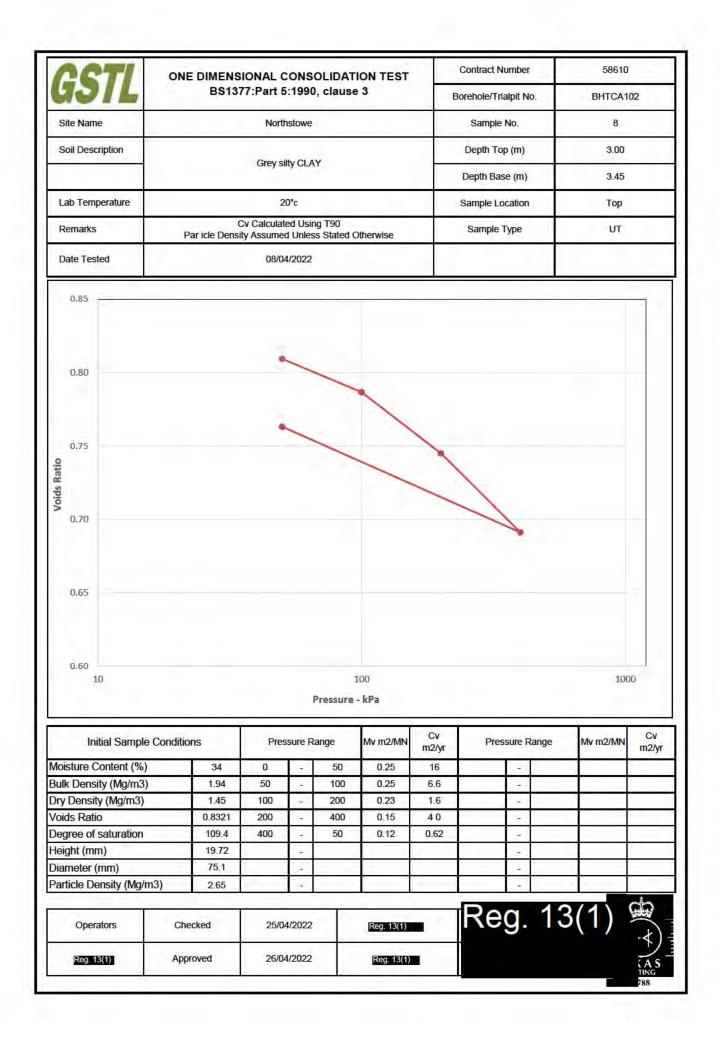


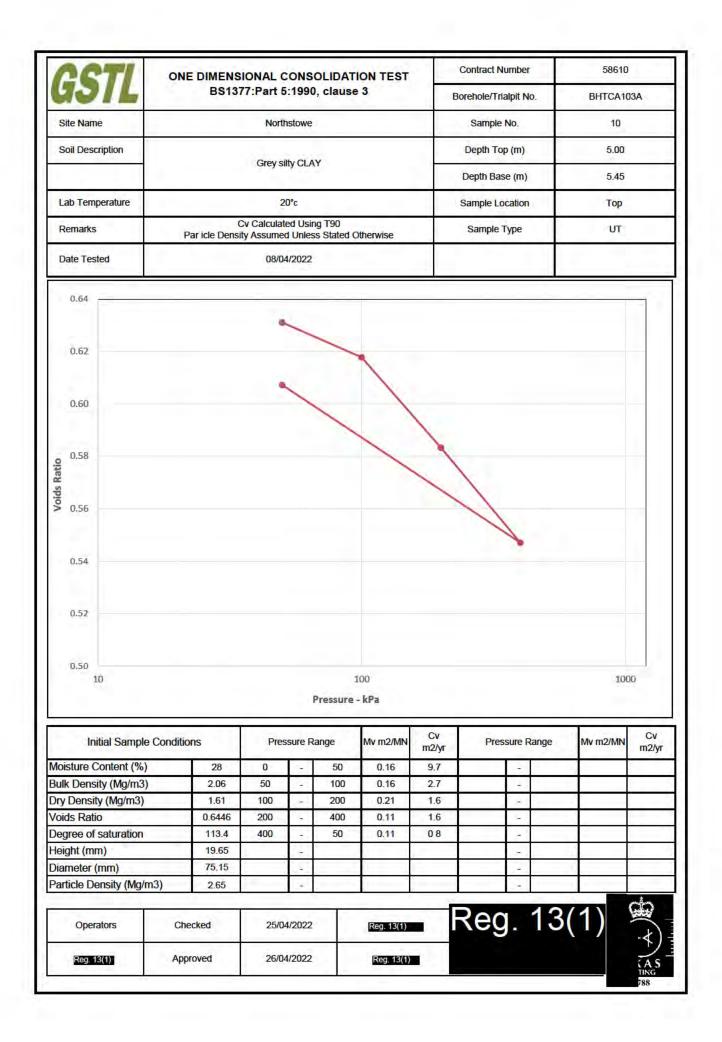










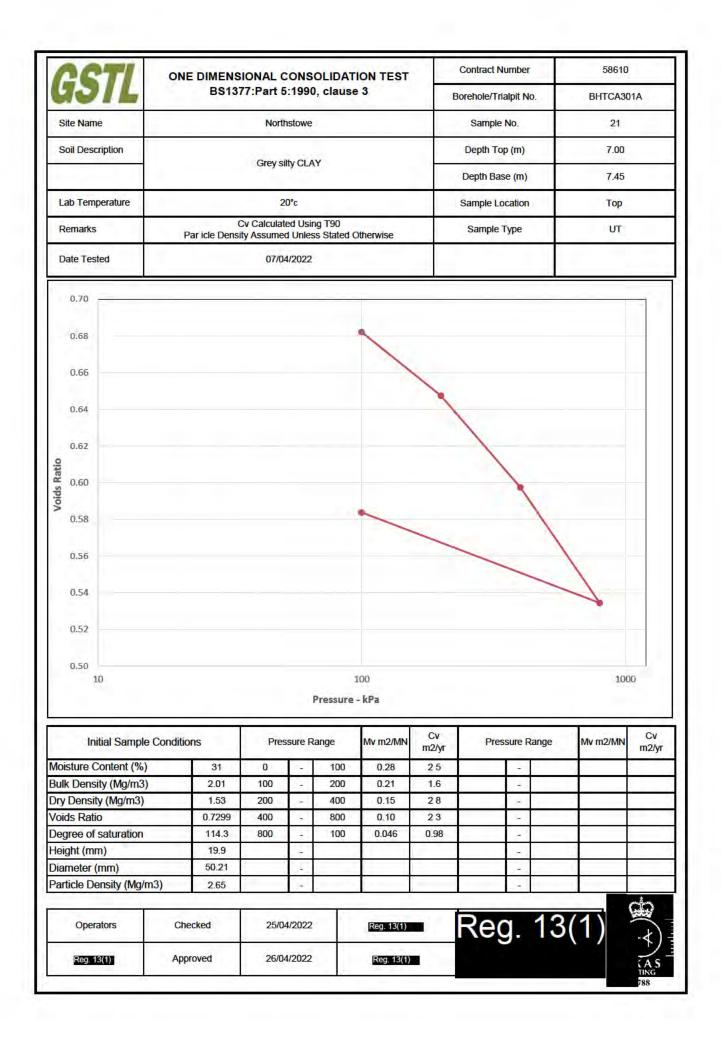


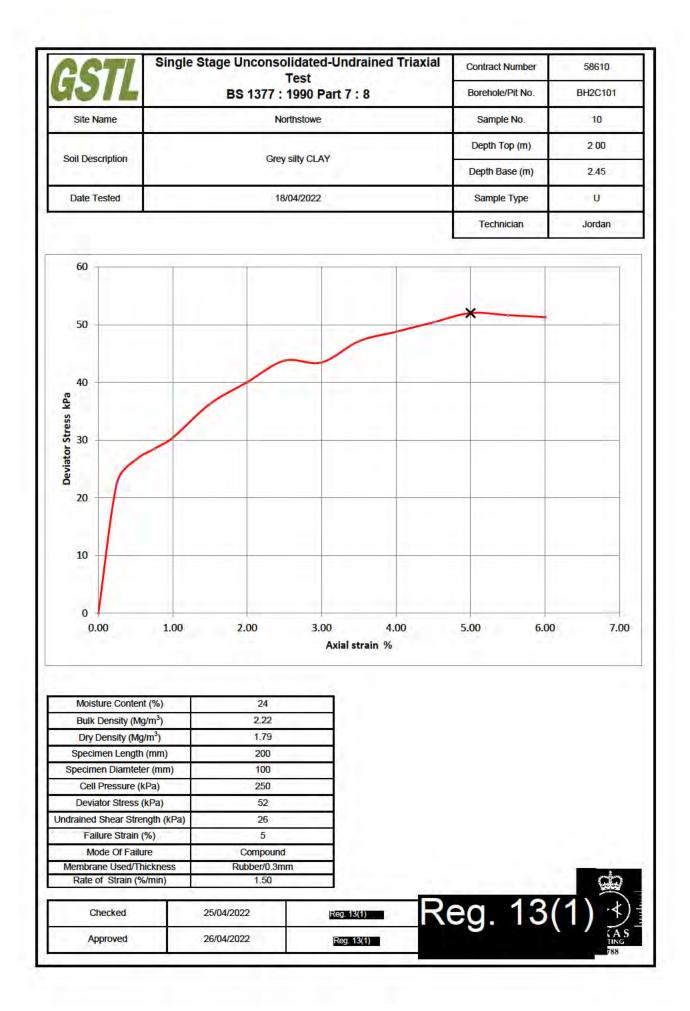
CCTI	ONE	DIMENS	IONAL C	ONS	OLIDAT	ION TEST		Contract Number	58610	1	
USIL		BS137	7:Part 6	5:1990	), claus	e 3	E	Borehole/Trialpit No.	BHTCA	07	
Site Name		Northstowe					Sample No.	8			
Soil Description					N.			Depth Top (m)	3.00		
			Grey si	ity CLA	Y			Depth Base (m)	3.45		
Lab Temperature			2	0°c				Sample Location	Тор		
Remarks Cv Par icle Density			v Calculat	ed Usir	ng T90	Otherwise		Sample Type	UT	UT	
Date Tested				4/2022					100		
				_							
0.83											
0.82						/					
0.81						7					
0.80							1				
0.79											
0.78								1.			
Spio						1					
0.77								1			
							1				
0.76							1				
								11			
0.75								V			
0.74								Y			
0.73			10				10	00	1	000	
				į.	Pressure	- kPa					
Initial Sample	e Conditio	ns	Pres	ssure R	ange	Mv m2/MN	Cv m2/yr	Pressure Range	Mv m2/MN	Cv m2/yr	
loisture Content (%)		33	0	-	25	SWELL	SWELL	-			
ulk Density (Mg/m3)		1.97	25	191	50	0.23	11	-			
ry Density (Mg/m3)		1.48	50	10	100	0.33	73	· · ·			
oids Ratio egree of saturation		0.7932	100	-	200 50	0.24	7 0 0.37	-	-		
leight (mm)		20.15		-			2.27	-	5		
)iameter (mm)		75.15		141				-	4	1	
Particle Density (Mg/r	m3)	2.65		3-	-		-	-		màn	
Operators	Che	cked	25/0	4/2022		Reg. 13(1)		Reg. 13	3(1)		
		roved	26/04/2022			Reg. 13(1)					
Reg. 13(1)									8	TING	

0	CTI	ONE DIMEN		CONS	OLIDAT	ION TEST		Contract Number		58610	)
57	JIL		377:Part					Borehole/Trialpit N	o.	BHTCA2	202
Site N	ame		Nort	hstowe	st			Sample No.		10	
Soil D	escription		Omi	illy CL	v			Depth Top (m)		3.00	0
			Greys	ilty CLA	u.			Depth Base (m)		3.45	
Lab T	emperature	1		20°c				Sample Location	CH -	Тор	
Rema	rks	Cv Calculated U Par icle Density Assumed Un			ng T90 ss Stated (	Otherwise		Sample Type		UT	
Date 1	rested	1.1.1	08/0	4/2022							
0.6	8										
0.6	6					~					
0.6	4						1	<			
0.0											
0.6	2					•		1			
							/	1			
0.6	0						1	1			
Voids Ratio								11			
oids 0.5	8							/			
> 0.0									1		
0.5	6								1		
0.5	4										
0.5	2										
0.5											
	1		10		Pressure	- kPa	10	00		1	000
	Initial Co.	Constitution	1				Cv				Cv
Antid	Initial Sample		1	ssure R	1.4	Mv m2/MN	m2/yr	Pressure R	ange	Mv m2/MN	m2/yr
	e Content (%) ensity (Mg/m3)	31 2.06	0 50	3	50 100	0.23	34 9.6	-			
_	nsity (Mg/m3) nsity (Mg/m3)	1.58	100	-	200	0.19	9.6	-	for the second s		-
oids R		0.6814		101	400	0.14	4.4				
122.2.121.12	of saturation	120.4	400		50	0.11	0.49			-	
leight (		19.8	1	1761		1.	-	(.)			
Diamete	er (mm)	75,11		161				-	2	17 15	
	Density (Mg/m	n3) 2.65	1	1÷			-	-			. *
Particle	perators	Checked	25/0	4/2022		Reg. 13(1)		Reg.	13(	1)	
				26/04/2022							$\mathbf{Y}$
O	g. 13(1)	Approved	26/0	4/2022		Reg. 13(1)					AS

CCTI				DATION TEST		Contract Number	58610	0
GOIL	BS1	377:Part	5:1990, cla	use 3	Bo	prehole/Trialpit No.	BHTCA	202
Site Name		Nort	hstowe			Sample No.	34	
Soil Description		Crows	ilty CLAY			Depth Top (m)	10.00	)
		Greys	MICY OLAT			Depth Base (m)	10.45	5
Lab Temperature	1.10	2	20°c	-		Sample Location	Тор	
Remarks	Par icle Der	Cv Calcula sity Assume	ted Using T9 ed Unless Sta	0 ted Otherwise		Sample Type	UT	
Date Tested	$1.1 \times 4$	08/0	4/2022				5.1	
0.80								
0.00								
63								
0.75					~			
0.70						1		
201					~	1		
Voids Ratio						//	3	
Voids						A		
1 mm							1	
0.60							1	
0.60							1	
							1	
0.60							1	
				100			10	000:
0.55			Press	100 sure - kPa			10	000:
0.55	€ Conditions	Pre	Press ssure Range	sure - kPa	Cv m2/vr	Pressure Range	10 Mv m2/MN	
0.55 0.50 10 Initial Sample		Pre	ssure Range	sure - kPa	Cv m2/yr 15	Pressure Range	1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3)	33 ) 1.99	0 200	ssure Range	Mv m2/MN 00 0.095 00 0.17	m2/yr 15 3.7		1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3)	33 ) 1.99 1.49	0 200 400	ssure Range - 2 - 4 - 8	Mv m2/MN 00 0.095 00 0.17 00 0.11	m2/yr 15 3.7 2.7	-	1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3) Voids Ratio	33 ) 1.99 1.49 0.7772	0 200 400 800	ssure Range - 2 - 4 - 8 - 4	Mv m2/MN 00 0.095 00 0.17 00 0.11 00 0.05	m2/yr 15 3.7 2.7 0 3		1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3)	33 ) 1.99 1.49	0 200 400	ssure Range - 2 - 4 - 8 - 4	Mv m2/MN 00 0.095 00 0.17 00 0.11	m2/yr 15 3.7 2.7	-	1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3) Voids Ratio Degree of saturation Height (mm)	33 ) 1.99 1.49 0.7772 113.1	0 200 400 800	ssure Range - 2 - 4 - 8 - 4 - 2	Mv m2/MN 00 0.095 00 0.17 00 0.11 00 0.05	m2/yr 15 3.7 2.7 0 3		1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3) Voids Ratio Degree of saturation	33 1.99 1.49 0.7772 113.1 18.81 75.09	0 200 400 800	ssure Range - 2 - 4 - 8 - 4 - 2 - 2	Mv m2/MN 00 0.095 00 0.17 00 0.11 00 0.05	m2/yr 15 3.7 2.7 0 3		1	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3) Voids Ratio Degree of saturation Height (mm) Diameter (mm)	33 1.99 1.49 0.7772 113.1 18.81 75.09	0 200 400 800 400	ssure Range - 2 - 4 - 8 - 4 - 2 - 2	Mv m2/MN 00 0.095 00 0.17 00 0.11 00 0.05	m2/yr 15 3.7 2.7 0 3 0.18	- - - - - - - - -	Mv m2/MN	
0.55 0.50 10 Initial Sample Moisture Content (%) Bulk Density (Mg/m3) Dry Density (Mg/m3) Voids Ratio Degree of saturation Height (mm) Diameter (mm) Particle Density (Mg/m	33 ) 1.99 1.49 0.7772 113.1 18.81 75.09 n3) 2.65	0 200 400 800 400	ssure Range - 2 - 4 - 8 - 4 - 2 - 2	wre - kPa Mv m2/MN 00 0.095 00 0.17 00 0.11 00 0.05 00 0.13	m2/yr 15 3.7 2.7 0.3 0.18		Mv m2/MN	

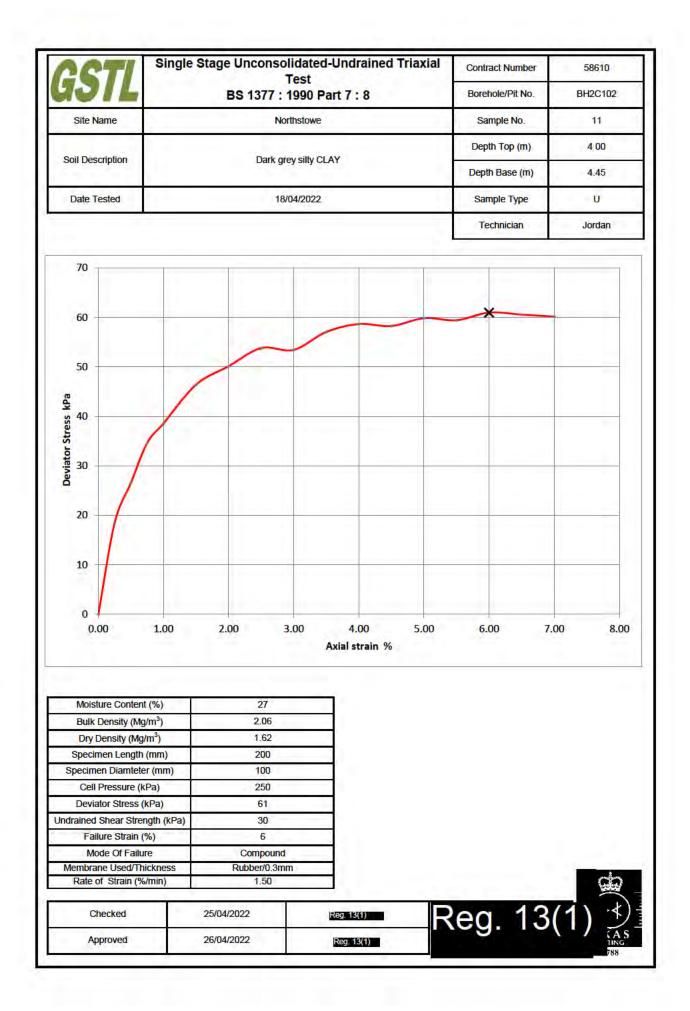
All stores where the second	ONE DIMENS	IONAL C	ONS	OLIDAT	TION TEST		Contract Number		58610	)
USIL		77:Part 5					Borehole/Trialpit No	N	BHTCA30	01A
Site Name		North	stowe	1			Sample No.		15	
Soil Description		-		v			Depth Top (m)		4.00	
		Grey sil	ity CLA	(Y			Depth Base (m)		4.45	
Lab Temperature	1.1	20	0°c				Sample Location	ct li	Тор	
Remarks	C Par icle Densi	Cv Calculate ty Assumed	ed Usin 1 Unles	ng T90 is Stated (	Otherwise		Sample Type		UT	
Date Tested	1.1	08/04	4/2022							
0.70										
0.68					1					
						/				
0.66						1				
0.66										
o 0.64					1					
s Rat						1				
Voids Ratio						/				
> 0.62										
							/ /			
0.60							11			
0.60							//			
0.60							//			
0.60							//			
								1		
0.58								1		
		10				1	00	1	1	.000
0.58		10	1	Pressure	- kPa	10	20	1	1	000
0.58	le Conditions		I sure R		- kPa Mv m2/MN	10 Cv m2/yr	00 Pressure Ra	ange	1 Mv m2/MN	1.1
0.58 0.56 1 Initial Samp						Cv	1	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3	b) 31 3) 2.04	Pres	sure R	ange	Mv m2/MN	Cv m2/yr	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3 Dry Density (Mg/m3	b) 31 3) 2.04 ) 1.56	Pres 0 50 100	sure R	tange 50 100 200	Mv m2/MN 0.13 0.25 0.24	Cv m2/yr 15 9 3 9	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3 Voids Ratio	b) 31 3) 2.04 ) 1.56 0.6945	Pres 0 50 100 200	sure R	tange 50 100 200 400	Mv m2/MN 0.13 0.25 0.24 0.16	Cv m2/yr 15 9 39 28	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3) Voids Ratio Degree of saturation	b) 31 3) 2.04 ) 1.56 0.6945 1 116.5	Pres 0 50 100		tange 50 100 200	Mv m2/MN 0.13 0.25 0.24	Cv m2/yr 15 9 3 9	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3) Voids Ratio Degree of saturation Height (mm)	b) 31 3) 2.04 ) 1.56 0.6945 1 116.5 18.54	Pres 0 50 100 200		tange 50 100 200 400	Mv m2/MN 0.13 0.25 0.24 0.16	Cv m2/yr 15 9 39 28	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3) Voids Ratio Degree of saturation	b) 31 3) 2.04 ) 1.56 0.6945 1 116.5 18.54 75.23	Pres 0 50 100 200		tange 50 100 200 400	Mv m2/MN 0.13 0.25 0.24 0.16	Cv m2/yr 15 9 39 28	Pressure Ra	ange	Contraction of the	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3) Voids Ratio Degree of saturation Height (mm) Diameter (mm) Particle Density (Mg	b) 31 3) 2.04 ) 1.56 0.6945 1 116.5 18.54 75.23 /m3) 2.65	Pres 0 50 100 200 400	sure R	tange 50 100 200 400 50	Mv m2/MN 0.13 0.25 0.24 0.16	Cv m2/yr 15 9 39 28	Pressure Ra		Mv m2/MN	1.1
0.58 0.56 1 Initial Samp Moisture Content (% Bulk Density (Mg/m3) Voids Ratio Degree of saturation Height (mm) Diameter (mm)	b) 31 3) 2.04 ) 1.56 0.6945 1 116.5 18.54 75.23	Pres 0 50 100 200 400	sure R	tange 50 100 200 400 50	Mv m2/MN 0.13 0.25 0.24 0.16	Cv m2/yr 15 9 39 28 0.71	Pressure Ra		Mv m2/MN	n

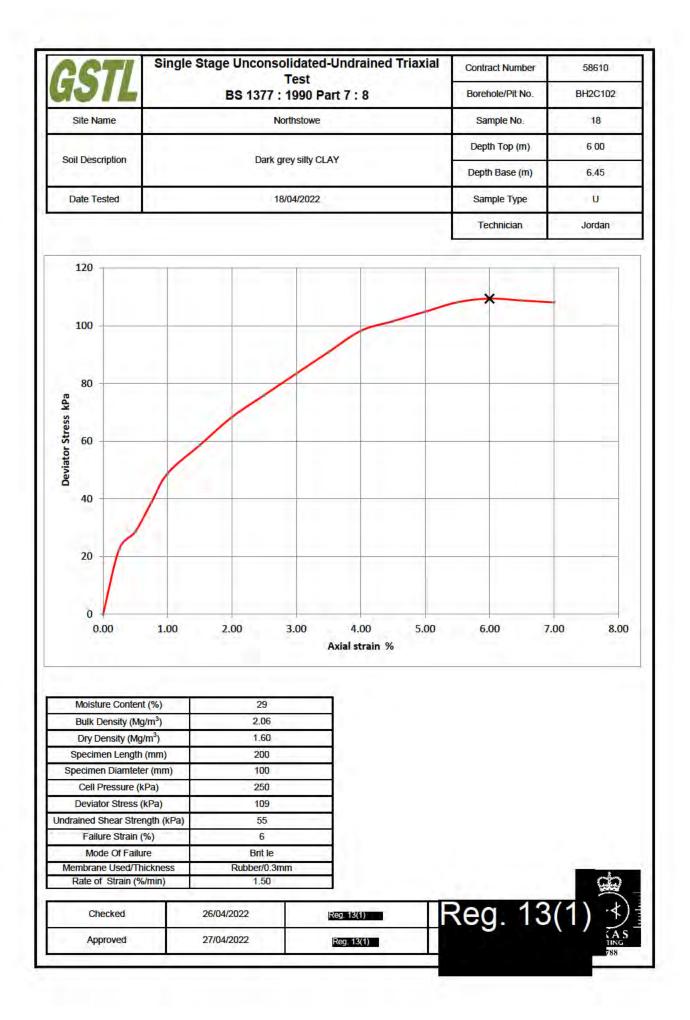


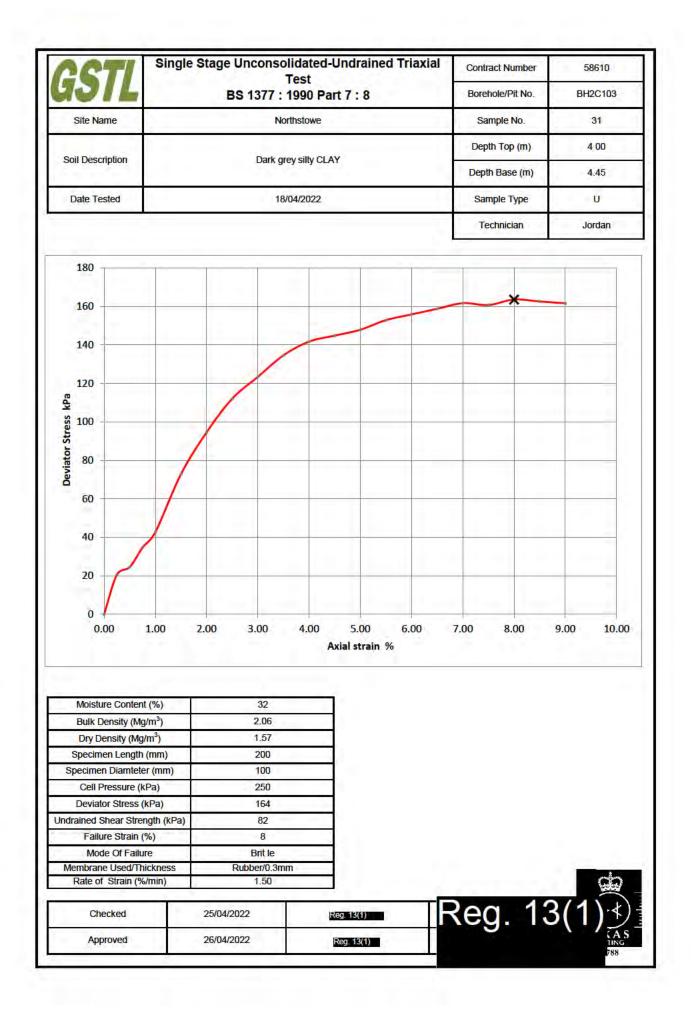


ACTI	Single Stage Unconsolida		Contract Number	58610
491L	Tes BS 1377 : 199		Borehole/Pit No.	BH2C101
Site Name	Northst	owe	Sample No.	14
			Depth Top (m)	4 00
Soil Description	Grey silty	CLAY	Depth Base (m)	4.45
Date Tested	18/04/2	022	Sample Type	U
			Technician	Jordan
300				
250		*		-
200				
Deviator Stress kPa				
150	- /			
ator				
Devi				
100				
1				
50				
1				
0				
U	2.00 4.00	6.00 8.0	0 10.00	12
0.00			10100	
0.00				
0.00		Axial strain %		
0.00				
Moisture Content (%	s) <u>30</u>			
Moisture Content (% Bulk Density (Mg/m	a) <u>30</u> a) <u>2.23</u>			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m	b) 30 b) 2.23 b) 1.71			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m <sup>3</sup> Specimen Length (m	b) 30 b) 2.23 ) 1.71 m) 201			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m	b) 30 b) 2.23 c) 1.71 m) 201 nm) 100			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (n	a) 30 a) 2.23 ) 1.71 m) 201 nm) 100 ) 250			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa	a) 30 a) 2.23 ) 1.71 m) 201 nm) 100 ) 250 a) 245			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa Deviator Stress (kP Undrained Shear Strengt Failure Strain (%)	30       3)     2.23       )     1.71       m)     201       nm)     100       )     250       a)     245       a)     123       8			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa Deviator Stress (kP Undrained Shear Strengt Failure Strain (%) Mode Of Failure	30         30           3)         2.23           )         1.71           m)         201           nm)         100           )         250           a)         245           n (kPa)         123           8         Compound			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa Deviator Stress (kP Undrained Shear Strengt Failure Strain (%) Mode Of Failure Membrane Used/Thick	30         30           3)         2.23           )         1.71           m)         201           nm)         100           )         250           a)         245           a)         123           8         Compound           ness         Rubber/0.3mm			
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa Deviator Stress (kP Undrained Shear Strengt Failure Strain (%) Mode Of Failure	30         30           3)         2.23           )         1.71           m)         201           nm)         100           )         250           a)         245           a)         123           8         Compound           ness         Rubber/0.3mm	Axial strain %		
Moisture Content (% Bulk Density (Mg/m Dry Density (Mg/m Specimen Length (m Specimen Diamteter (r Cell Pressure (kPa Deviator Stress (kP Undrained Shear Strengt Failure Strain (%) Mode Of Failure Membrane Used/Thick	30         30           3)         2.23           )         1.71           m)         201           nm)         100           )         250           a)         245           a)         123           8         Compound           ness         Rubber/0.3mm	Axial strain %	eg. 13(	1) ···

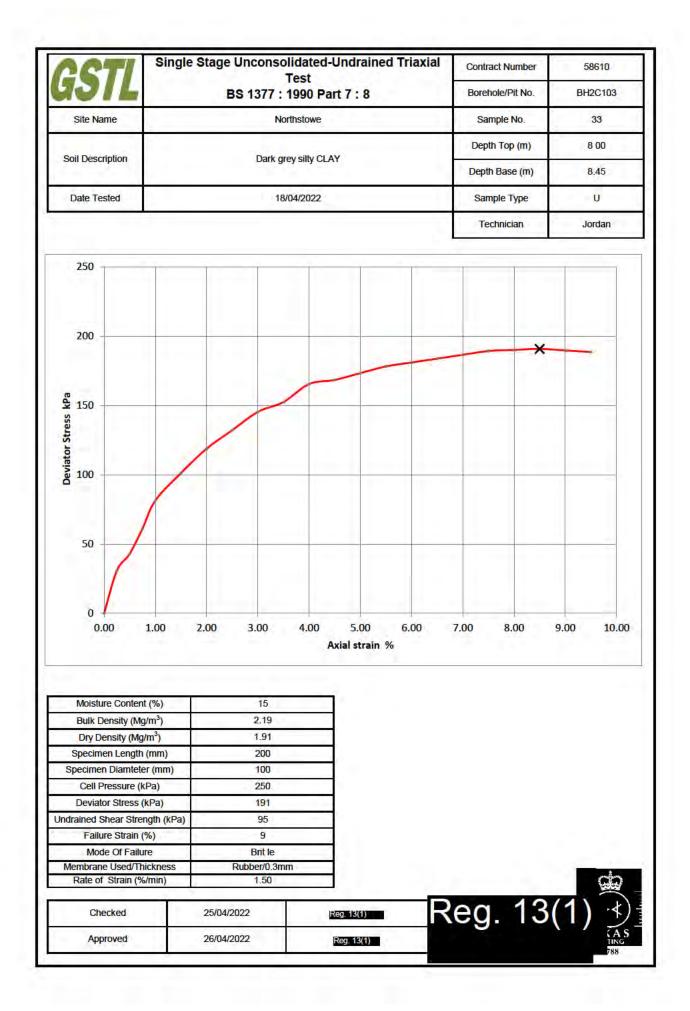
<b>GST</b>	Single		Test			tract Number	58610
ACIE	-	BS 1377 : 1	1990 Part 7 :	8	Bor	ehole/Pit No.	BH2C101
Site Name	2	Nor	thstowe		S	ample No.	17
Coll Description		8-11	weith OLAY		De	epth Top (m)	6 00
Soil Description		Dark gre	ey silty CLAY		De	oth Base (m)	6.45
Date Tested	1	18/0	04/2022		Si	ample Type	U
						lechnician	Jordan
180							
100			2 2 1 2				
160			_		_	×	
				-			
140							
120			/				
Deviator Stress kPa							
Stre	1						
- 08 ato	1						
Devi	1						
60							
-							
40							_
20							10.41
0							-
0.00	1.00	2.00 3.00	4.00	5.00	6.00	7.00	8.00 9.00
			Axial s	strain %			
_		_					
Moisture Conten	(9/)	29	1				
Bulk Density (Mg		2.14					
Dry Density (Mg		1.67					
Specimen Length		200					
Specimen Diamtete		100					
	Pa)	250					
Cell Pressure (k	(Pa)	155					
Deviator Stress (		78					
Deviator Stress ( Undrained Shear Stree	ngth (kPa)						
Deviator Stress ( Undrained Shear Strei Failure Strain (	ngth (kPa) %)	8					
Deviator Stress ( Undrained Shear Stren Failure Strain ( Mode Of Failu	ngth (kPa) %) re	8 Brit le					
Deviator Stress ( Jndrained Shear Strei Failure Strain (	ngth (kPa) %) re ickness	8	n				(da)
Deviator Stress ( Undrained Shear Stree Failure Strain ( Mode Of Failu Membrane Used/Th	ngth (kPa) %) re ickness	8 Brit le Rubber/0.3mn	n	()	Rec	1.13	(1)
Deviator Stress ( Undrained Shear Stref Failure Strain ( Mode Of Failu Membrane Used/Th Rate of Strain (%	ngth (kPa) %) re ickness	8 Brit le Rubber/0.3mn 1.50		(1)	Reg	g. 13(	(1) (1)



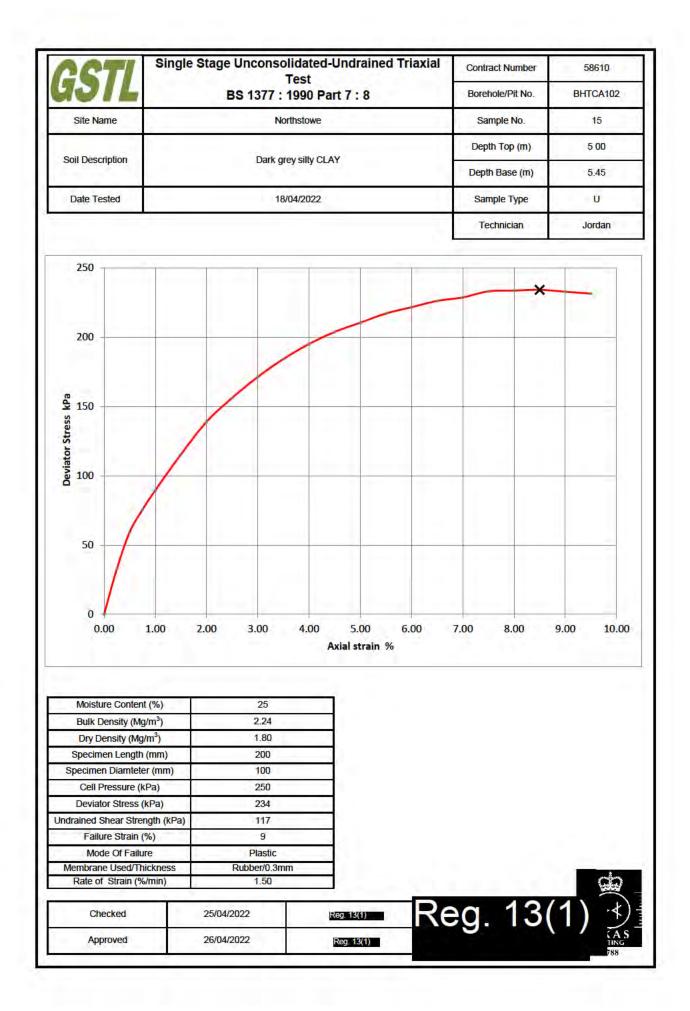


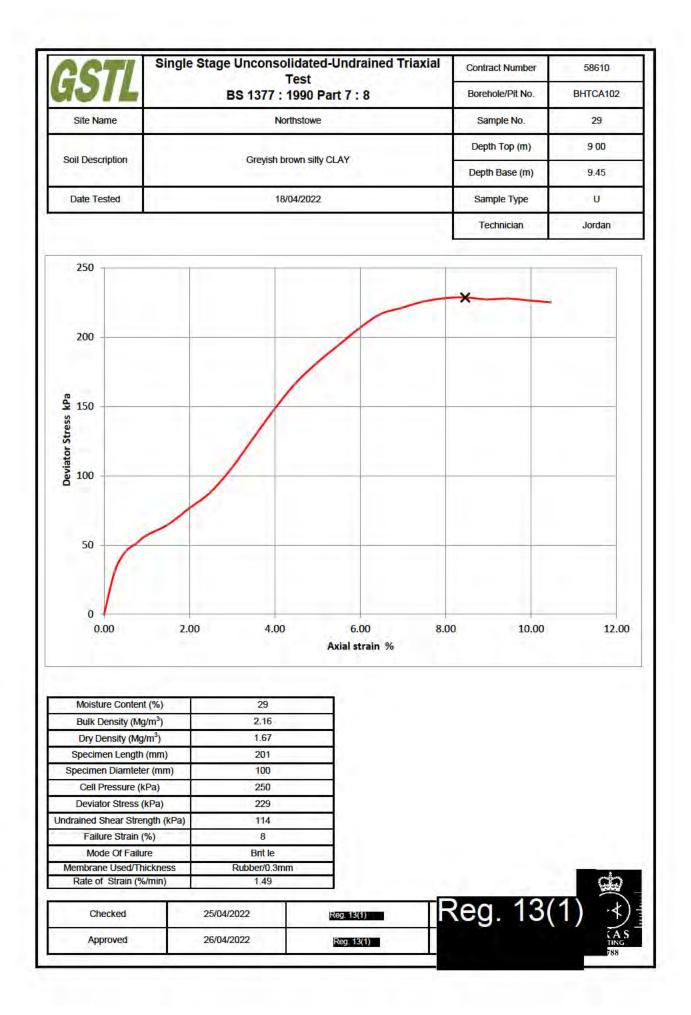


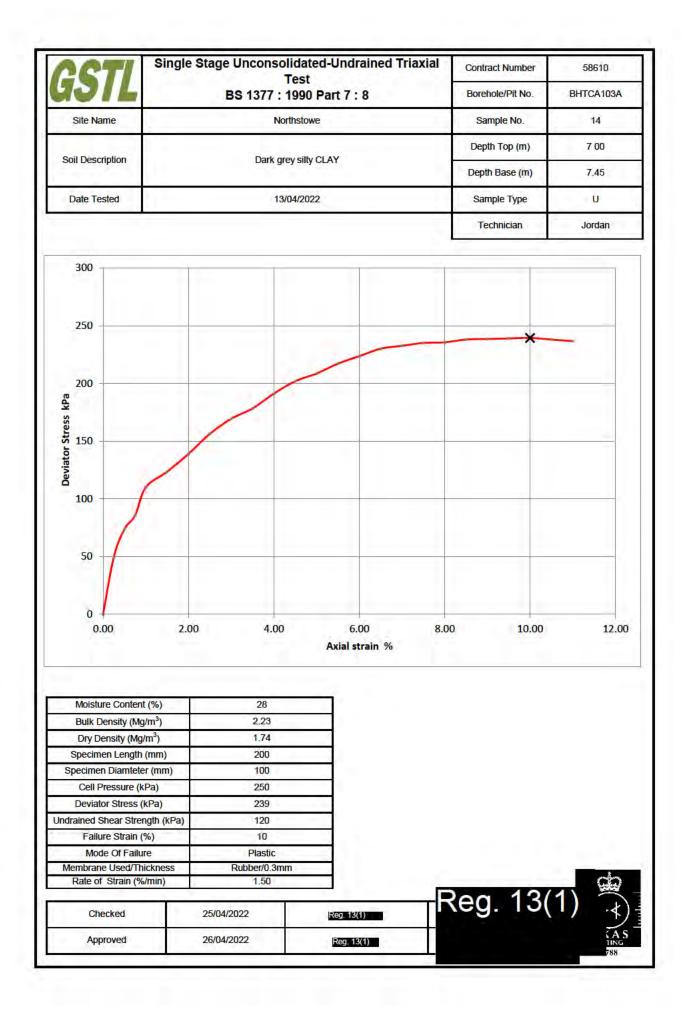
OCTI	Single	Stage U	Inconso	lidated-U	ndrained	Triaxial	Contrac	t Number	586	10
531L		BS		Test 1990 Part	7:8		Boreho	le/Pit No.	BH2C	103
Site Name	-			rthstowe		-	Sam	ple No.	32	2
							Depth	Top (m)	6 0	0
Soil Description			Dark gre	ey silty CLAY			Depth I	Base (m)	6.4	5
Date Tested	-		18/	/04/2022		- 1	Samp	le Type	U	
							Tech	nician	Jord	lan
200	1							×		
180	_				-			^	-	
160										
140										
		/	1111							
120		/								
ess	/									-
100	1									
ator										
80						_			-	-
1								1.7		
60										-
									_	
40							_			-
20										
20										
	1					_				
0.00	1.00	2.00	3.00	4.00	5.0	0 6.0	00 7	7.00	8.00	9.00
					al strain %					
				1						
Moisture Content Bulk Density (Mg/			30 2.16							
Dry Density (Mg/r		-	1.67							
Specimen Length (			200							
Specimen Diamteter			100							
Cell Pressure (kF	Pa)		250							
Deviator Stress (k			189							
Indrained Shear Stren			95							
Failure Strain (%			8							
and a state of the second second			Brit le	m						
Mode Of Failur		R	ubber/0.3mr 1.50	0		1	1	1.00		á
Mode Of Failur Membrane Used/Thio Rate of Strain (%/				10 C			na	131	1)	· *
Membrane Used/Thio		25/04/20	22	Reg	. 13(1)		cy.	10(		Γ.
Membrane Used/Thio Rate of Strain (%/		25/04/20			. 13(1) g. 13(1)		cy.	13(	•)	AS

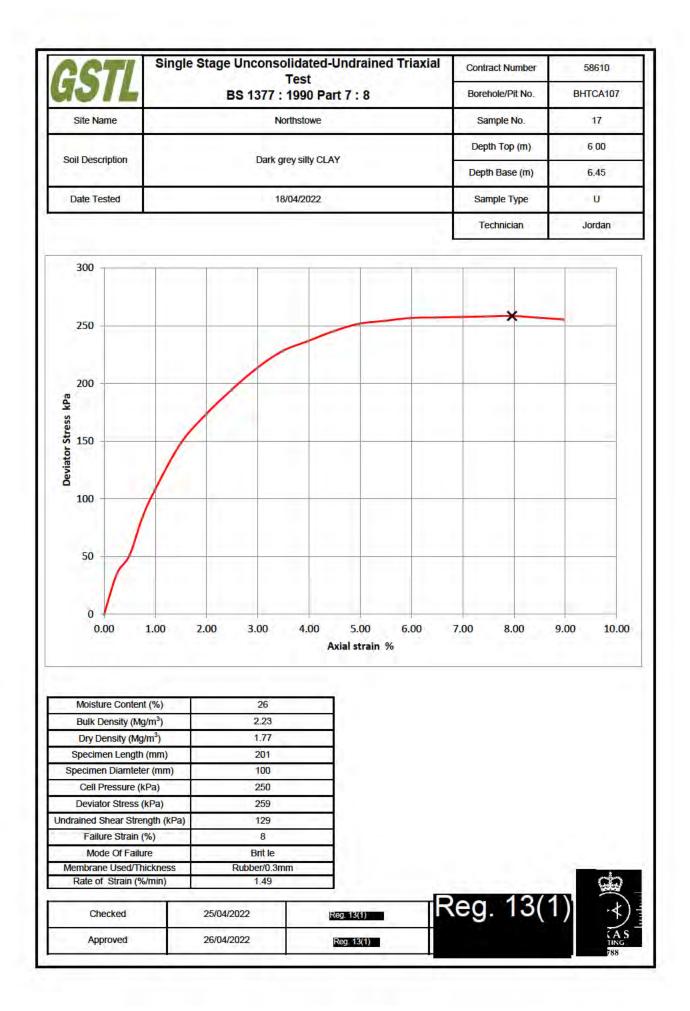


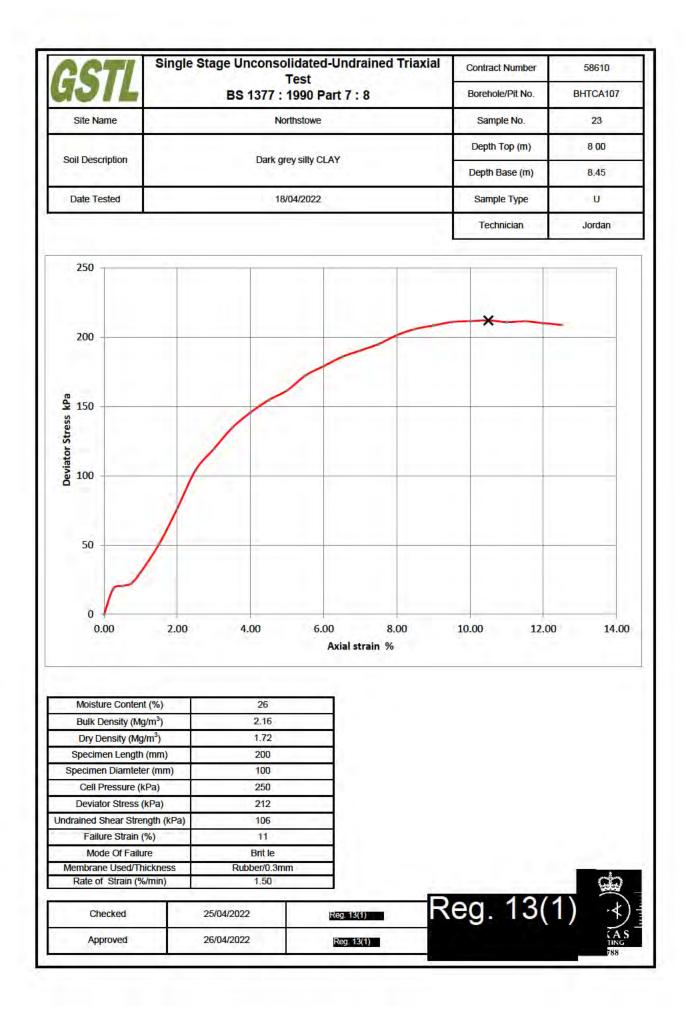
n c	Single Sta			drained Triaxia	Contra	ct Number	58610
571L			Test 1990 Part 7	: 8	Boreh	ole/Pit No.	BH2C104
Site Name		No	orthstowe		San	nple No.	20
					Dept	n Top (m)	6 00
Soil Description		Grey	silty CLAY		Depth	Base (m)	6.45
Date Tested		18	/04/2022		Sam	ple Type	U
					Тес	hnician	Jordan
160 -				Ť	T		
140						*	_
			1				
120			/				
		/					
g 100		/					
00 Deviator Stress KPa	1.5	0					
Stres	/						
tor	1						
Devia							
<b>Č</b> 60	1						-
40					-		
20							
0							
0	2.00	4.00	(c)	5.00	8.00	10.00	12
	2.00	4.00		5.00 strain %	8.00	10.00	12
	2.00	4.00			8.00	10.00	
		4.00			8.00	10.00	1.
0.00 Moisture Content ( Bulk Density (Mg/r	%) n <sup>3</sup> )	17 2.28			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/r Dry Density (Mg/r	%) n <sup>3</sup> )	17 2.28 1.95			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r	%) n <sup>3</sup> ) nm)	17 2.28 1.95 191			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter	%) n <sup>3</sup> ) 1 <sup>3</sup> ) nm) (mm)	17 2.28 1.95 191 100			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP	%) n <sup>3</sup> ) 1 <sup>3</sup> ) nm) (mm) a)	17 2.28 1.95 191			8.00	10.00	12
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP Deviator Stress (kr	%) n <sup>3</sup> ) 1 <sup>3</sup> ) nm) (mm) a) <sup>2</sup> a)	17 2.28 1.95 191 100 250			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP Deviator Stress (kr	%) n <sup>3</sup> ) 1 <sup>3</sup> ) nm) (mm) a) Pa) Pa)	17 2.28 1.95 191 100 250 145			8.00	10.00	
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP Deviator Stress (kl Undrained Shear Streng Failure Strain (% Mode Of Failure	%) n <sup>3</sup> ) <sup>3</sup> ) (mm) (mm) a) Pa) Pa) (th (kPa)	17 2.28 1.95 191 100 250 145 72 10 Brit le	Axial	strain %			
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP Deviator Stress (kl Undrained Shear Streng Failure Strain (%	%) n <sup>3</sup> ) 1 <sup>3</sup> ) (mm) (mm) a) 2a) 2a) (th (kPa) ) (kness	17 2.28 1.95 191 100 250 145 72 10	Axial	strain %			
0.00 Moisture Content ( Bulk Density (Mg/n Dry Density (Mg/n Specimen Length (r Specimen Diamteter Cell Pressure (kP Deviator Stress (kl Undrained Shear Streng Failure Strain (% Mode Of Failure Membrane Used/Thio	%) n <sup>3</sup> ) 1 <sup>3</sup> ) (mm) (mm) a) a) <sup>2</sup> a) th (kPa) ) th (kPa) ) th (kPa)	17 2.28 1.95 191 100 250 145 72 10 Brit le Rubber/0.3m	Axial	strain %		10.00	

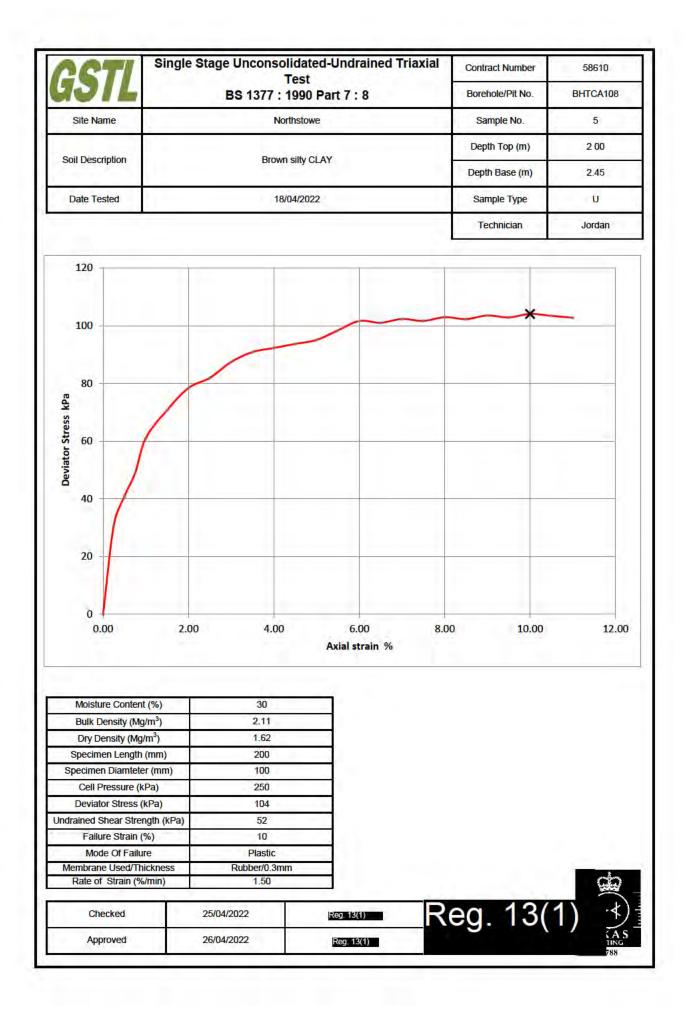




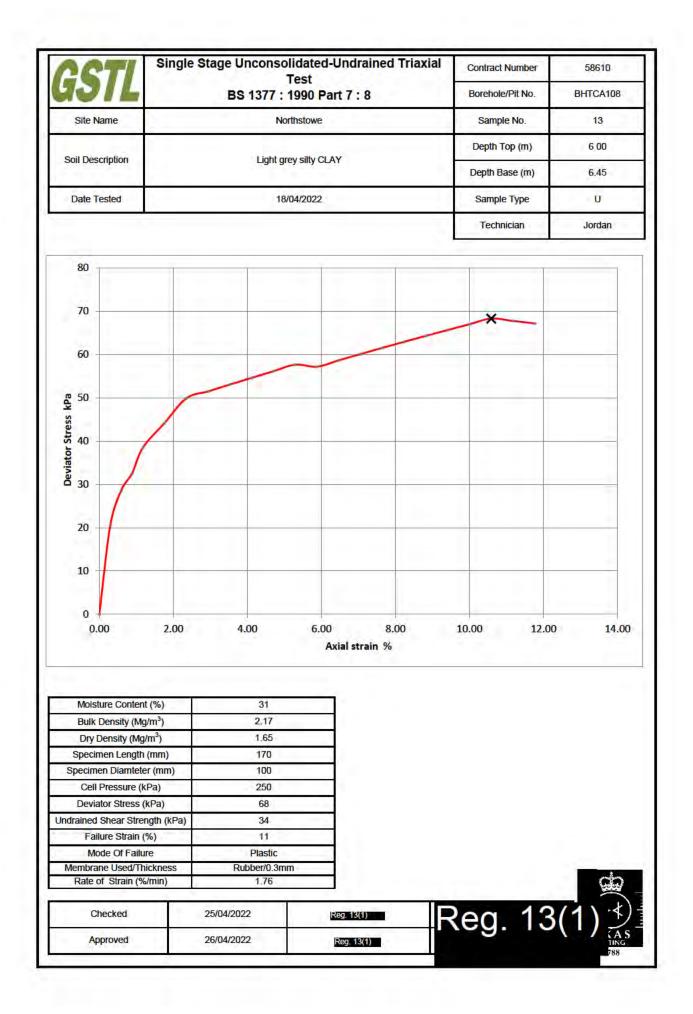




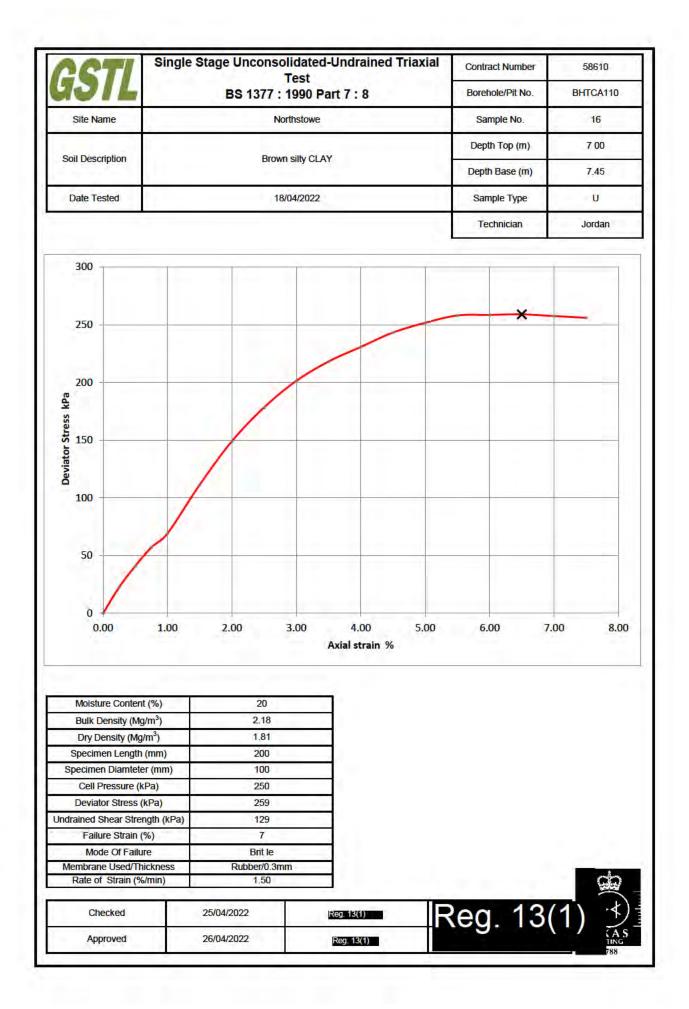


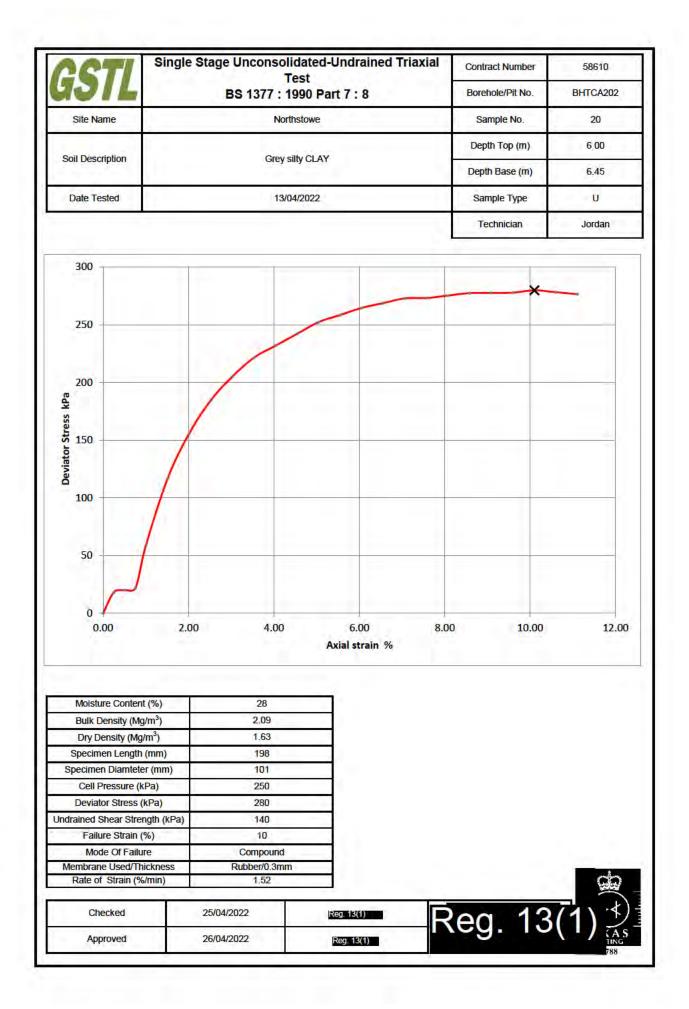


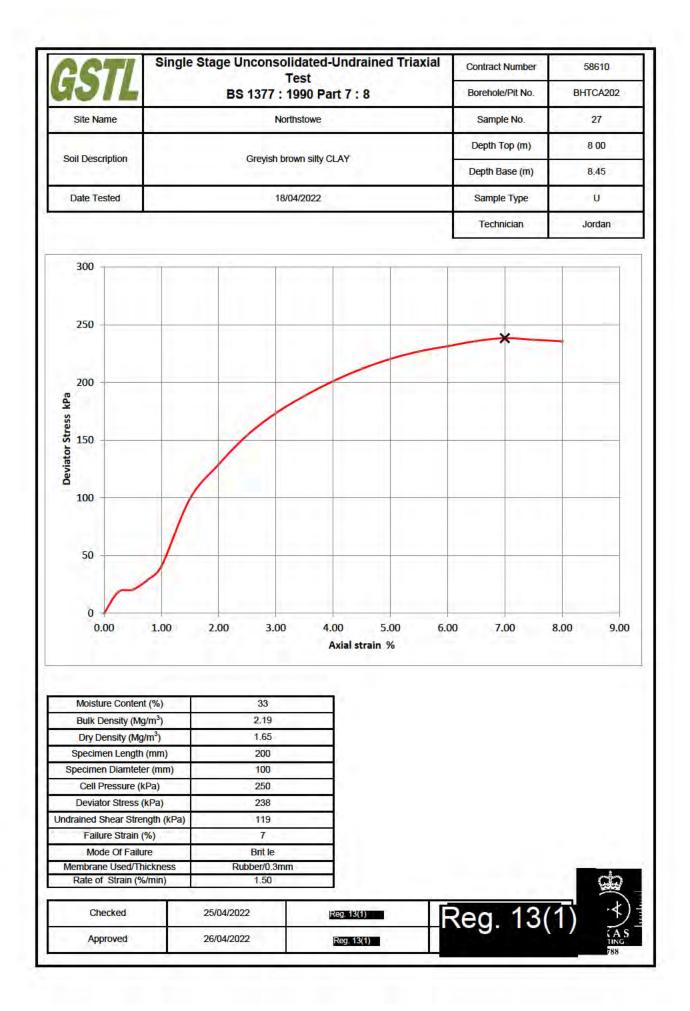
CCTI	Single	Stage Unconsol	idated-Undrai 'est	ned Triaxial	Contract Number	586
GJIL			1990 Part 7 : 8		Borehole/Pit No.	BHTC
Site Name	2	Nort	Sample No.	9		
			a and		Depth Top (m)	4 0
Soil Description	144	Greys	silty CLAY		Depth Base (m)	4.4
Date Tested	1	18/0	)4/2022		Sample Type	U
				3	Technician	Jord
100					1	
90						
90			-		×	-
80			/			
70		/				
		1				
₫ 60	- /	<u></u>				
ress	/					
Deviator Stress kPa						
viato	1					
A0 40	1					
20						
30						
20						
20						
10						
10				-		
0				-		_
0.00	1.00	2.00	3.00	4.00	5.00 6.0	0
			Axial stra	in 0/		
				11 70		
10.04.20				11 70		
				111 70		
Moisture Conten		36		in 70		
Moisture Conten Bulk Density (Mg	g/m³)	2.09		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg	g/m <sup>3</sup> ) g/m <sup>3</sup> )	2.09 1.54		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length	g/m <sup>3</sup> ) g/m <sup>3</sup> ) 1 (mm)	2.09 1.54 200		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtete	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm)	2.09 1.54 200 100		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtete Cell Pressure (h	g/m <sup>3</sup> ) g/m <sup>3</sup> ) 1 (mm) er (mm) kPa)	2.09 1.54 200 100 250		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtet Cell Pressure (H Deviator Stress	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa)	2.09 1.54 200 100 250 89		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtete Cell Pressure (I Deviator Stress Undrained Shear Stre	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) ength (kPa)	2.09 1.54 200 100 250 89 44		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtete Cell Pressure (H Deviator Stress of Undrained Shear Stree Failure Strain	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) (kPa) ength (kPa) (%)	2.09 1.54 200 100 250 89 44 6		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtetr Cell Pressure (H Deviator Stress Undrained Shear Stre Failure Strain Mode Of Failu Membrane Used/Th	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) (kPa) ength (kPa) (%) ure nickness	2.09 1.54 200 100 250 89 44		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtetr Cell Pressure (H Deviator Stress Undrained Shear Stre Failure Strain Mode Of Failu	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) (kPa) ength (kPa) (%) ure nickness	2.09 1.54 200 100 250 89 44 6 Brit le		111 70		
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtetr Cell Pressure (H Deviator Stress Undrained Shear Stre Failure Strain Mode Of Failu Membrane Used/Th	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) (kPa) ength (kPa) (%) ure nickness	2.09 1.54 200 100 250 89 44 6 Brit le Rubber/0.3mm				1 )]]
Moisture Conten Bulk Density (Mg Dry Density (Mg Specimen Length Specimen Diamtete Cell Pressure (H Deviator Stress Undrained Shear Stree Failure Strain (M Mode Of Failu Membrane Used/TT Rate of Strain (%	g/m <sup>3</sup> ) g/m <sup>3</sup> ) n (mm) er (mm) kPa) (kPa) (kPa) ength (kPa) (%) ure nickness	2.09 1.54 200 100 250 89 44 6 Brit le Rubber/0.3mm 1.50			Reg. 13(1	1)]



ACTI	Single S			Irained Triaxial	Contract Number	58610
<b>431L</b>			Test 1990 Part 7	: 8	Borehole/Pit No.	BHTCA110
Site Name		No	orthstowe		Sample No.	10
					Depth Top (m)	4 00
Soil Description		Grey	silty CLAY		Depth Base (m)	4.45
Date Tested		13/	/04/2022	1	Sample Type	U
					Technician	Jordan
50						
45						
40	_	-				-
	/					
35	/					
e a	/					
20 Periator Stress Kb						
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15	_					
10	_					-
5	_					
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0.00	1.00	2.00	3.00 Axial s	4.00 strain %	5.00 6.00	) 7
			0.000			
Moisture Content	(%)	39				
Bulk Density (Mg	1.0.1	2.10				
Dry Density (Mg/		1,51				
Specimen Length		200				
Specimen Diamtete		100				
Cell Pressure (k		250				
Deviator Stress ( Undrained Shear Strer		44 22				
Unuranicu Jiical Jilel		5				
		Plastic	-			
Failure Strain ( Mode Of Failu			-			
Failure Strain ( Mode Of Failu Membrane Used/Th	and the second se	Rubber/0.3m	m			
Failure Strain ( Mode Of Failu	and the second se	Rubber/0.3mi 1.50	m		_	G
Failure Strain ( Mode Of Failu Membrane Used/Th	and the second se			5(1)	Reg. 13(	(1)







GS					00 101	TAR	7:3:1	550]				
Contract Number						5861	D					
Site Name						Northsto	owe					
Date Tested	20.04.2022						_					
	1		-			Lucia	Location of	Diameter		-	Han	l Vane
BH/TP Number/ Window sample	Sample Number	Sample Type	D	epth (m	))	Moisture Content	Test Horizon	of Tube (mm)	Vane Size (mm)	Disturbed / Undisturbed	Peak	Residua
TPTCA113	4	В	1.00		2.00	24	THUR LUT	(court)	33	Disturbed	40	17
TPTCA204	5	В	2.00	(12)	3.00	22.7			33	Disturbed	138	45
TPTCA208	4	В	1.00	0.90	2.00	14.8			33	Disturbed	106	58
WSTCA109	3	В	2.00	1050	3.00	18	2	=	33	Disturbed	149	14
WSTCA112	1	B	0.90	6.0	1.30	22			33	Disturbed	152	76
WSTCA116	1	В	1.20	1	1.50	16			33	Disturbed	68	31
			_	(196)								2
	1			1.5-21								
			-	1.0-01								1

Key	Reported As
Moisture Content	%
Hand Vane	kPa
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Operators	Checked	25/04/2022	Reg. 13(1)	Reg. 13(1)

<b>GST</b>	Z	Cert			emical R 279)	Analysis			t Number eference	e he	58610 10052307	
Client	-		,	Arca				in the second second	eceived	-	10032301	-
	_			Alto	iuis			Date K	eceiveu			_
Site Name	-			Norths	stowe			Date S	Started		20/04/2022	
								Date Co	mpleted		26/04/2022	
1							-	No. of S	Samples		4	
Hole Number	Sample Number	Sample Type	C	)epth (n	n)	Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
TPTCA208	1	D	0.50	161	1.00	0.21	0.04	8.9	8.06	0.10	<1	<10
TPTCA208	3	D	2.00		3.00	0.29	0.05	11	8.22	0.12	<1	<10
BH2C102	16	В	5.00	×	5.50	0.31	0.05	7.7	8.30	0.13	<1	<10
TPTCA119	4	В	1.20	-	3.00	0.25	0.04	9.1	8.11	0.12	<1	<10
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			-	-			-					-
				181								
Key			ted As	1				10 1 1 1 1 5 A P	arks			
Acid Soluble			SO <sub>4</sub>				N	CP = No Ch	loride Prese	nt		
Aqueous Extrac Chloride Conte			SO₄ CI/I	1								
PH Val			25°	1								
Total Sul			S	1								
Magnesi		g/l :	SO4									
Nitrate	9		mg/l	1								
Test Operate	or -	Checke	d and Auth	orised t	ру			Do	g. 1	3/1	N	
Reg. 13(1)		Date		26/04/	2022	Reg. 1	3(1)	Le L	y. I	3		





#### ANALYTICAL TEST REPORT

Contract no: 108224 Contract name: Northstowe Client reference: NSTO Clients name: Geo Site & Testing Services Clients address: Unit 3 and 4 Heol Aur Dafen Industrial Estate, Dafen Llanelli, Carmarthenshire SA14 80N 14 April 2022 Samples received: Analysis started: 14 April 2022 Analysis completed: 25 April 2022 Report issued: 25 April 2022

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:



Reg. 13(1) Reporting Team Lead

Lab number			108224-1	108224-2	108224-3	108224-4	108224-5	108224-6
Sample id			BHTCA101	BHTCA101	BHTCA101	BHTCA102	BH2C102	BHTCA102
Depth (m)			0.50-0.70	2.00-2.50	5.00-5.50	0.50-0.70	2.10- 2.50	3.50-4.00
Sample Type			B2	B6	B15	B2	B6	D11
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CE004 U	un ts	8.7	8.9	8.8	8.6	8.2	7.9
Magnesium (2:1 water soluble)	CE061	mg/l Mg	1.8	2.5	13	28	14	55
Chloride (2:1 water soluble)	CE049 <sup>U</sup>	mg/I CI	6.0	3.6	7.7	8.0	8.9	67
Nitrate (2:1 water soluble)	CE049 <sup>U</sup>	mg/I NO <sub>3</sub>	5.9	1.2	1.9	20	2.2	4.4
Sulphate (2:1 water soluble)	CE061 U	mg/I SO <sub>4</sub>	427	55	362	1706	284	1066
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	2363	480	2787	4287	1770	4372
Sulphur (total)	CE119	mg/kg S	1060	229	7576	2907	909	4393
Sulphur (total)	CE119	% w/w S	0.11	0.02	0.76	0.29	0.09	0.44

Lab number			108224-7	108224-8	108224-9	108224-10	108224-11	108224-12
Sample id			BHTCA103A	BHTCA103A	BHTCA104	BHTCA104	BHTCA104	BHTCA107
Depth (m)			0.20-0.50	4.00-4.50	0.50-0.70	3.00-3.50	6.50-7.00	3.00-3.45
Sample Type			B1	B8	B2	В9	D19	B10
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CE004 U	un ts	8.1	8.1	9.4	8.5	8.5	8.2
Magnesium (2:1 water soluble)	CE061	mg/I Mg	2.6	11	2.4	53	38	72
Chloride (2:1 water soluble)	CE049 <sup>U</sup>	mg/I CI	63	11	17	35	19	20
Nitrate (2:1 water soluble)	CE049 U	mg/I NO <sub>3</sub>	19	3.3	10	3.6	1.8	3.3
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	752	409	1456	1900	999	1626
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	2257	2065	3934	23098	4050	4946
Sulphur (total)	CE119	mg/kg S	1190	4559	1810	9459	8047	15498
Sulphur (total)	CE119	% w/w S	0.12	0.46	0.18	0.95	0.80	1.55

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Lab number			108224-13	108224-14	108224-15	108224-16	108224-17	108224-18
Sample id			BHTCA107	BHTCA108	BHTCA108	BHTCA110	BHTCA202	BHTCA202
Depth (m)			5.00-5.45	0.50-0.80	5.00-5.45	0.40-0.60	0.20-0.60	1.70-2.00
Sample Type			B15	B1	D11	B2	B4	D7
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CEOO4 U	un ts	8.2	8.3	8.0	8.0	8.1	8.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	38	8.6	82	34	31	19
Chloride (2:1 water soluble)	CE049 U	mg/I CI	11	7.4	18	9.2	7.8	8.1
Nitrate (2:1 water soluble)	CE049 U	mg/I NO <sub>3</sub>	2.4	6.8	1.7	20	31	5.6
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	884	240	1937	1505	1570	628
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	2989	660	18026	8075	10579	1596
Sulphur (total)	CE119	mg/kg S	6494	505	7555	2972	4256	683
Sulphur (total)	CE119	% w/w S	0.65	0.05	0.76	0.30	0.43	0.07

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Lab number			108224-19	108224-20	108224-21	108224-22	108224-23	108224-24
Sample id			TPTCA102	TPTCA103	TPTCA104	TPTCA105	TPTCA113	TPTCA114
Depth (m)			0.50-1.00	0.50-1.00	0.20-0.80	0.20-0.50	2.00-3.00	0.20-0.50
Sample Type			D3	В3	D2	D2	В5	B2
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CEOO4 U	un ts	8.3	8.0	8.2	10.1	9.0	8.1
Magnesium (2:1 water soluble)	CE061	mg/l Mg	2.6	16	5.6	<1	3.0	18
Chloride (2:1 water soluble)	CE049 U	mg/l Cl	5.1	9.6	10	7.6	14	5.4
Nitrate (2:1 water soluble)	CE049 <sup>U</sup>	mg/I NO <sub>3</sub>	9.3	14	16	7.3	2.4	2.6
Sulphate (2:1 water soluble)	CEO61 <sup>U</sup>	mg/I SO <sub>4</sub>	116	1510	167	608	116	1498
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	359	6568	488	1868	647	3732
Sulphur (total)	CE119	mg/kg S	173	3341	291	844	308	1486
Sulphur (total)	CE119	% w/w S	0.02	0.33	0.03	0.08	0.03	0.15

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Lab number			108224-25	108224-26	108224-27	108224-28	108224-29	108224-30
Sample id			TPTCA114	TPTCA118	TPTCA204	TPTCA204	TPTCA208	WS2C101
Depth (m)			0.50-1.00	0.50-1.00	0.20-0.50	2.00-3.00	1.00-2.00	1.20-1.65
Sample Type			B3	B3	B2	D5	D4	D2
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CEOO4 U	un ts	7.7	8.0	7.8	8.3	8.2	8.3
Magnesium (2:1 water soluble)	CE061	mg/l Mg	6.4	10	42	11	51	67
Chloride (2:1 water soluble)	CE049 U	mg/I CI	7.2	7.2	29	14	17	12
Nitrate (2:1 water soluble)	CE049 <sup>U</sup>	mg/I NO <sub>3</sub>	100	14	37	9.5	7.2	8.1
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/l SO4	116	253	1630	763	1651	1715
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	539	904	14318	1750	8548	6178
Sulphur (total)	CE119	mg/kg S	317	370	5488	615	4331	2564
Sulphur (total)	CE119	% w/w S	0.03	0.04	0.55	0.06	0.43	0.26

Lab number			108224-31	108224-32	108224-33	108224-34	108224-35	108224-36
Sample id			WS2C106	WS2C108	WS2C108	WS2C112	WS2C120	WS2C120
Depth (m)			1.20-1.65	1.20-1.65	1.80-2.70	2.00-2.45	1.20-1.65	2.70-2.80
Sample Type			D2	D1	B2	2.00-2.40 D2	D1	D3
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CE004 U	un ts	8.4	8.4	8.1	8.0	8.3	8.1
Magnesium (2:1 water soluble)	CE061	mg/l Mg	16	6.4	46	63	21	74
Chloride (2:1 water soluble)	CE049 <sup>U</sup>	mg/I Cl	4.5	3.0	72	12	7.5	21
Nitrate (2:1 water soluble)	CE049 <sup>U</sup>	mg/I NO <sub>3</sub>	2.9	3.7	3.2	3.8	1.6	1.3
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/l SO <sub>4</sub>	599	180	1586	1901	554	1932
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	1827	897	81273	16604	3367	26645
Sulphur (total)	CE119	mg/kg S	641	401	29260	6307	1373	10410
Sulphur (total)	CE119	% w/w S	0.06	0.04	2.93	0.63	0.14	1.04

h			i	1	1	1	1	1
Lab number			108224-37	108224-38	108224-39	108224-40	108224-41	108224-42
Sample id			WS2C121	WS2C121	WS2C123	WS2C123	WSTCA109	WSTCA112
Depth (m)			1.20-1.65	2.00-2.45	0.70	2.00-2.45	2.00-3.00	0.90-1.30
Sample Type			D2	D3	B1	D3	В3	B15
Date sampled			-	-	-	-	-	-
Test	Method	Units						
рН	CEOO4 U	un ts	8.6	8.1	8.4	8.3	8.1	8.5
Magnesium (2:1 water soluble)	CE061	mg/l Mg	39	72	12	70	43	11
Chloride (2:1 water soluble)	CE049 <sup>U</sup>	mg/I CI	11	18	32	21	11	8.6
Nitrate (2:1 water soluble)	CE049 U	mg/I NO <sub>3</sub>	1.3	5.1	3.6	3.3	2.0	<1
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	1616	2066	873	1919	1820	431
Sulphate (total)	CE062 U	mg/kg SO <sub>4</sub>	5188	49024	2956	70761	16292	1402
Sulphur (total)	CE119	mg/kg S	1939	15257	1270	23080	11389	753
Sulphur (total)	CE119	% w/w S	0.19	1.53	0.13	2.31	1.14	0.08

			-	
Lab number			108224-43	108224-44
Sample id		WSTCA117	WSTCA117	
Depth (m)			1.50-2.00	2.50-2.80
Sample Type			B2	B4
Date sampled			-	-
Test	Method	Units		
рН	CEOO4 <sup>U</sup>	un ts	8.1	7.7
Magnesium (2:1 water soluble)	CE061	mg/I Mg	5.9	69
Chloride (2:1 water soluble)	CEO49 <sup>U</sup>	mg/I CI	9.6	19
Nitrate (2:1 water soluble)	CEO49 <sup>U</sup>	mg/I NO <sub>3</sub>	1.3	1.7
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	138	1882
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	995	47633
Sulphur (total)	CE119	mg/kg S	457	16234
Sulphur (total)	CE119	% w/w S	0.05	1.62

# METHOD DETAILS

METHOD	SOLLS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	рН	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/I Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/I CI
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/I NO <sub>3</sub>
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/I SO <sub>4</sub>
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO <sub>4</sub>
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

#### DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Кеу

- N No (not deviating sample)
- Y Yes (deviating sample)
- NSD Sampling date not provided
- NST Sampling time not provided (waters only)
- EHT Sample exceeded holding time(s)
- IC Sample not received in appropriate containers
- HP Headspace present in sample container
- NCF Sample not chemically fixed (where appropriate)
- OR Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108224-1	BHTCA101	0.50-0.70	Y	All (NSD)
108224-2	BHTCA101	2.00-2.50	Y	All (NSD)
108224-3	BHTCA101	5.00-5.50	Y	All (NSD)
108224-4	BHTCA102	0.50-0.70	Y	All (NSD)
108224-5	BH2C102	2.10- 2.50	Y	All (NSD)
108224-6	BHTCA102	3.50-4.00	Y	All (NSD)
108224-7	BHTCA103A	0.20-0.50	Y	All (NSD)
108224-8	BHTCA103A	4.00-4.50	Y	All (NSD)
108224-9	BHTCA104	0.50-0.70	Υ	All (NSD)
108224-10	BHTCA104	3.00-3.50	Y	All (NSD)
108224-11	BHTCA104	6.50-7.00	Y	All (NSD)
108224-12	BHTCA107	3.00-3.45	Y	All (NSD)
108224-13	BHTCA107	5.00-5.45	Y	All (NSD)
108224-14	BHTCA108	0.50-0.80	Y	All (NSD)
108224-15	BHTCA108	5.00-5.45	Y	All (NSD)
108224-16	BHTCA110	0.40-0.60	Y	All (NSD)
108224-17	BHTCA202	0.20-0.60	Y	All (NSD)
108224-18	BHTCA202	1.70-2.00	Y	All (NSD)
108224-19	TPTCA102	0.50-1.00	Y	All (NSD)
108224-20	TPTCA103	0.50-1.00	Y	All (NSD)
108224-21	TPTCA104	0.20-0.80	Y	All (NSD)
108224-22	TPTCA105	0.20-0.50	Y	All (NSD)
108224-23	TPTCA113	2.00-3.00	Y	All (NSD)
108224-24	TPTCA114	0.20-0.50	Y	All (NSD)
108224-25	TPTCA114	0.50-1.00	Y	All (NSD)
108224-26	TPTCA118	0.50-1.00	Y	All (NSD)
108224-27	TPTCA204	0.20-0.50	Y	All (NSD)
108224-28	TPTCA204	2.00-3.00	Y	All (NSD)
108224-29	TPTCA208	1.00-2.00	Y	All (NSD)
108224-30	WS2C101	1.20-1.65	Y	All (NSD)

### DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Кеу

- N No (not deviating sample)
- Y Yes (deviating sample)
- NSD Sampling date not provided
- NST Sampling time not provided (waters only)
- EHT Sample exceeded holding time(s)
- IC Sample not received in appropriate containers
- HP Headspace present in sample container
- NCF Sample not chemically fixed (where appropriate)
- OR Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108224-31	WS2C106	1.20-1.65	Y	All (NSD)
108224-32	WS2C108	1.20-1.65	Y	All (NSD)
108224-33	WS2C108	1.80-2.70	Y	All (NSD)
108224-34	WS2C112	2.00-2.45	Y	All (NSD)
108224-35	WS2C120	1.20-1.65	Y	All (NSD)
108224-36	WS2C120	2.70-2.80	Y	All (NSD)
108224-37	WS2C121	1.20-1.65	Y	All (NSD)
108224-38	WS2C121	2.00-2.45	Y	All (NSD)
108224-39	WS2C123	0.70	Y	All (NSD)
108224-40	WS2C123	2.00-2.45	Y	All (NSD)
108224-41	WSTCA109	2.00-3.00	Y	All (NSD)
108224-42	WSTCA112	0.90-1.30	Y	All (NSD)
108224-43	WSTCA117	1.50-2.00	Y	All (NSD)
108224-44	WSTCA117	2.50-2.80	Υ	All (NSD)

### ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope. Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling. All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing. Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.





Qty

# Contract Number: 59102

Client Ref: Client PO: 14059902

Laboratory Report

Report Date: 05-05-2022

Client Arcadis Fortran Rd St Mellons Cardiff CF3 0EY

Contract Title:	North	nstowe
For the attention of:	Reg.	13(1)

Date Received: 19-04-2022 Date Completed: 05-05-2022

#### **Test Description**

Moisture Content of Soil	36
BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	
4 Point Liquid & Plastic Limit	36
BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	
BRE Full Suite	7
includes pH, water & acid soluble sulphate, total sulphur, magnesium, chloride and nitrate Sub-contracted Test	
Sub-contracted Test	
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days)	5
BS 1377:1990 - Part 5 : 3 - * UKAS	
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter)	3
BS 1377:1990 - Part 7 : 8 - * UKAS	
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- \* denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

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 Signatories:

Reg. 13(1) (Business Support Manager) - Reg. 13(1) (Director) - Reg. 13(1) (Quality/Technical Manager) Reg. 13(1) (Laboratory manager) - Reg. 13(1) (Site Manager) - Reg. 13(1) (Quality Assistant / Administrator / Health and Safety Coordinator)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GS	TL	NATU			PLAS	QUID LIMIT, PLASTIC LIMIT AND TICITY INDEX 00 - Part 2 : 4.3 & 5.3 )					
Contract Number						59102					
Site Name					N	orthstowe					
Date Tested					2	6/04/2022					
1					DES	CRIPTIONS					
Sample/Hole Reference	Sample Number	Sample Type	Depth (m)								
BHTCA105	3	В	1.20	-	1.70	Brown gravelly silty CLAY					
BHTCA105	5	В	2.00	(1997)	2.50	Brown gravelly silty CLAY					
BHTCA105	6	D	2.80	0.90	3.00	Grey fine to medium gravelly silty CLAY					
BHTCA105	10	D	4.80	(1 - 1)	5.00	Grey silty CLAY					
BHTCA105	14	D	6.80		7.00	Grey fine to medium gravelly silty CLAY					
BHTCA105	18	D	8.80	1990	9.00	Grey silty CLAY					
BHTCA106	5	В	1.70		2.00	Brown gravelly silty CLAY					
BHTCA106	10	D –	3.45	(1, -1)	3.55	Grey silty CLAY					
BHTCA106	18	D	5.50		6.00	Grey fine to medium gravelly silty CLAY					
BHTCA106	23	D	7.50	0.30	8.00	Grey silty CLAY					
BHTCA106	26	D	8.50		9.00	Grey silty CLAY					
BHTCA106	41	D	14.00	6	14.50	Brownish grey fine to medium gravelly silty CLAY					
	49	D	17.00		17.50	Grey silty CLAY					
BHTCA106	43	- P	11.00		11.00	City any Chity					

Operators	Checked
Reg. 13(1)	Approved

TP2C103

TP2C103

TP2C104

TP2C104

TP2C105

TP2C107

TP2C107

TP2C109

TP2C109

TP2C110

6

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1.40

3.00

0.50

3.00

1.40

1.10

3.00

0.70

1.70

1.90

Brown sandy silty CLAY

Grey silty CLAY

Brown gravelly silty CLAY

Grey silty CLAY

Brown silty CLAY

Brown silty CLAY

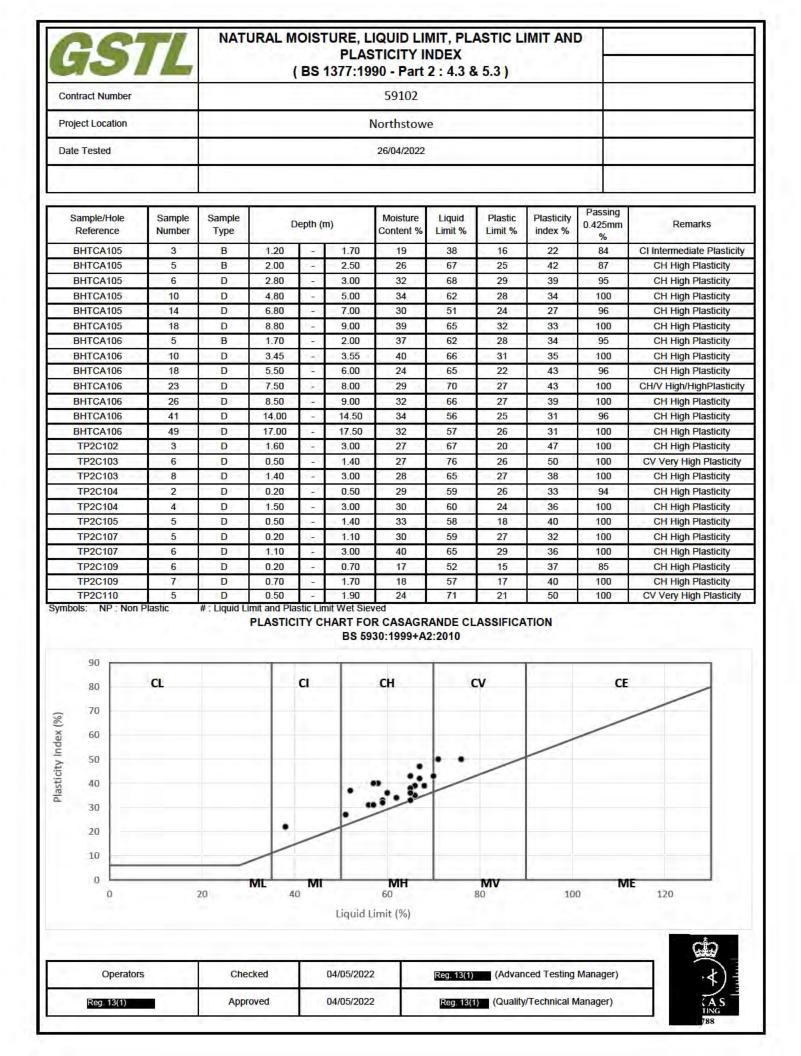
Brown silty CLAY

Brown gravelly silty CLAY

Brown silty CLAY

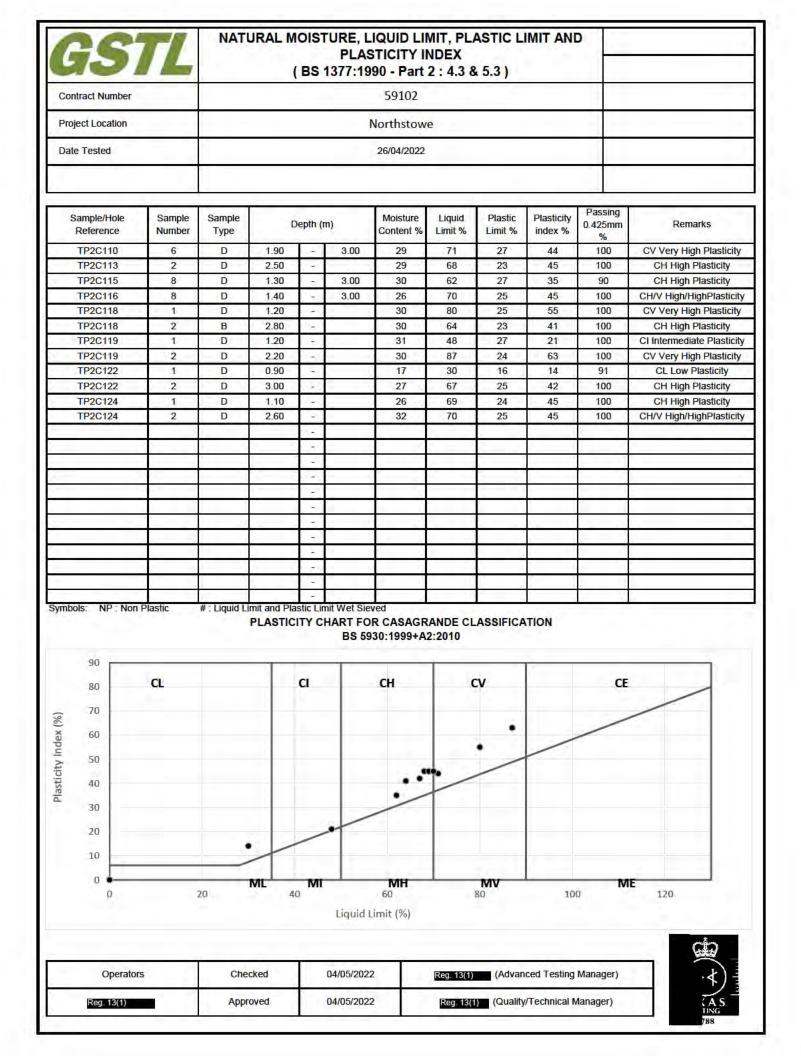
Brown silty CLAY



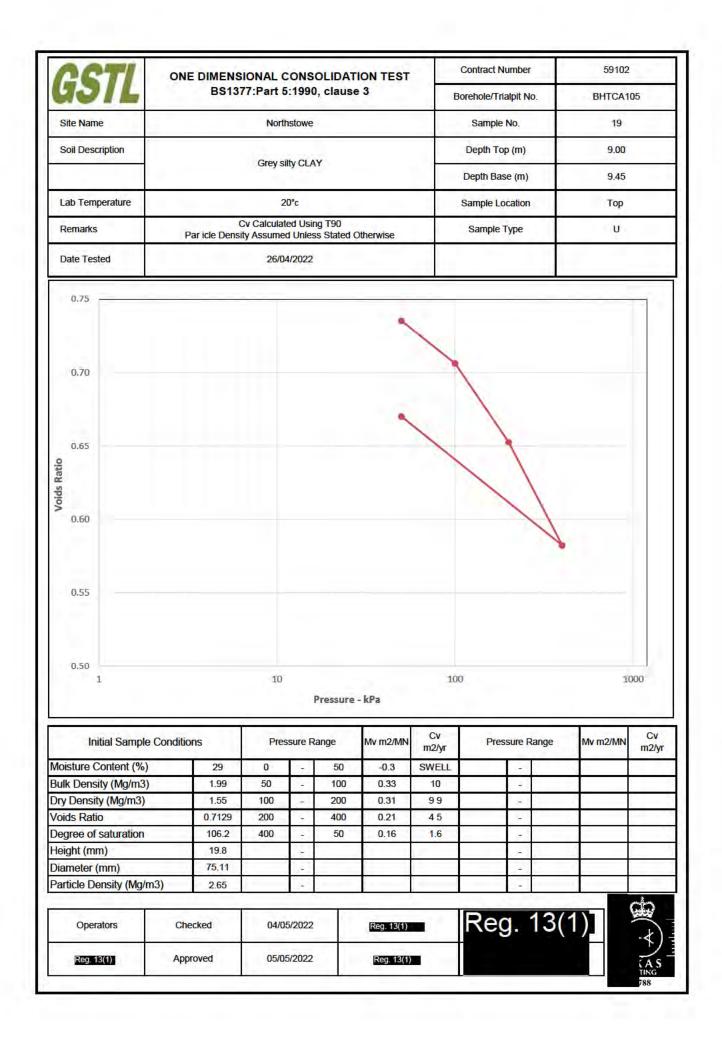


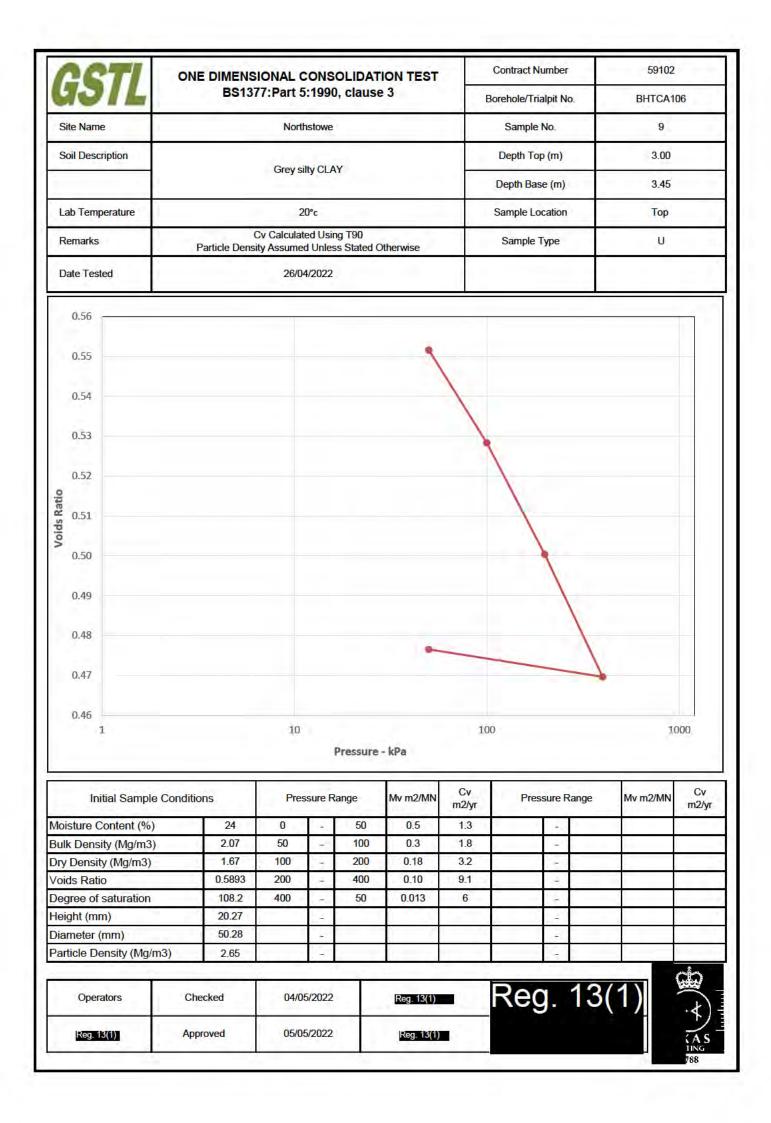
GS Contract Number						Part 2 : 4.3 & 5.3 )	
7.4.5							
Site Name						nstowe	
Date Tested	-	1			26/0	4/2022	
					DESCR	IPTIONS	
Sample/Hole Reference	Sample Number	Sample Type	D	epth (n	n)	Descriptions	
TP2C110	6	D	1.90	-	3.00	Brown sitty CLAY	
TP2C113 TP2C115	2	D	2.50		3.00	Grey silty CLAY Brown gravelly silty CLAY	
TP2C116	8	D	1.40	(1940)	3.00	Grey silty CLAY	
TP2C118	1	D	1.20		e v	Brown silty CLAY	
TP2C118	2	B	2.80	-		Brown silty CLAY	
TP2C119 TP2C119	1	D	1.20	1.00		Brown silty CLAY Brown silty CLAY	
TP2C122	1	D	0.90			Brown gravely sitty CLAY	
TP2C122	2	D	3.00	0.70		Brown silty CLAY	
TP2C124 TP2C124	1	D	1.10	141		Brown silty CLAY Grey silty CLAY	
	-			13 E			
				0.90			
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		1		the t	- <u>j</u>		
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	-		-	1.90			
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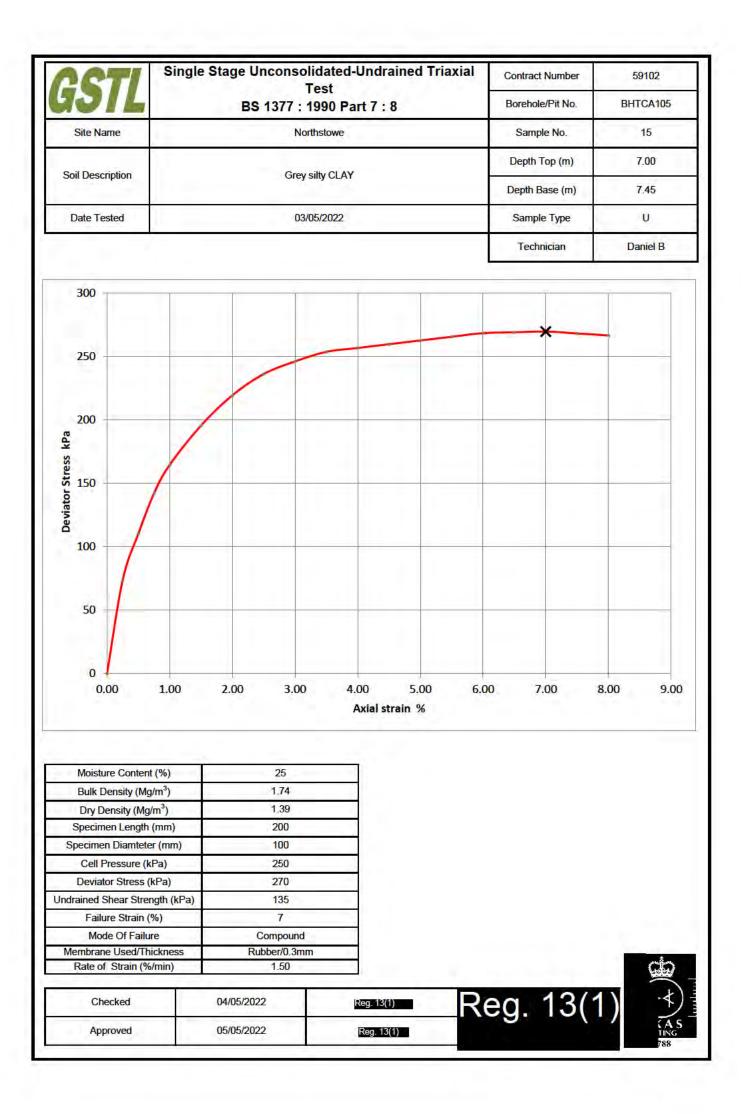
	and the second second second second second second second second second second second second second second second					ION TEST		Contract Nu	umber		59102	2
USIL		S1377:	Part 5	:1990	, clause	3	E	Borehole/Tria	alpit No	6	BHTCA	105
Site Name			North	nstowe	F			Sample I	No.		7	
Soil Description		16	Grey si	Ity CLA	Y			Depth Top (m) 3.0				
· · · · · · · · · · · ·								Depth Base	e (m)		3.45	
Lab Temperature			2	0°c				Sample Loo	cation	1	Тор	
Remarks	Par icle	Cv C Density A	Calculate ssume	ed Usir d Unles	ng T90 is Stated (	Otherwise		Sample T	уре		U	
Date Tested	1000	0	26/04	4/2022	2 *							
0.77				·								
0.76												
0.76						1						
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0.70 0.69 0.68 0.67 0.66						•				1		
0.70 0.69 0.68 0.67			10		Pressure	- kPa	10	0		7	1	1000
0.70 0.69 0.68 0.67 0.66 1	e Conditions			-		- kPa Mv m2/MN	Cv		sure R	ange	1 Mv m2/MN	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sampl	e Conditions	1		ssure R					sure R	ange	T	CY
0.70 0.69 0.68 0.67 0.66 1 Initial Sample foisture Content (% ulk Density (Mg/m3)	) 3 3) 1.	98	Pres 0 50	sure R	ange 50 100	Mv m2/MN -0.2 0.18	Cv m2/yr SWELL 6 2		_	ange	T	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sampl loisture Content (% ulk Density (Mg/m3) ry Density (Mg/m3)	) 3 6) 1. 1.	98 52	Pres 0 50 100	ssure R - -	ange 50 100 200	Mv m2/MN -0.2 0.18 0.19	Cv m2/yr SWELL 6 2 3.1		-	ange	T	Cv
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0.70 0.69 0.68 0.67 0.66 1 Initial Sampl Moisture Content (% Nulk Density (Mg/m3) Ory Density (Mg/m3) Voids Ratio Degree of saturation	) 3 3) 1. 0 1. 0.7 10	98 52 488 8.6	Pres 0 50 100		ange 50 100 200	Mv m2/MN -0.2 0.18 0.19	Cv m2/yr SWELL 6 2 3.1			ange	T	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sampl Noisture Content (% Nulk Density (Mg/m3) Yoids Ratio Degree of saturation leight (mm)	) 3 ) 1. . 1. 0.7 10 18	98 52 488	Pres 0 50 100 200	ssure R	ange 50 100 200 400	Mv m2/MN -0.2 0.18 0.19 0.11	Cv m2/yr SWELL 6 2 3.1 0 2		• • •	ange	T	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sample foisture Content (% sulk Density (Mg/m3) ry Density (Mg/m3) roids Ratio legree of saturation leight (mm) biameter (mm)	) 3 6) 1. 1. 0.7 10 18 75	98 52 488 8.6 .68	Pres 0 50 100 200		ange 50 100 200 400	Mv m2/MN -0.2 0.18 0.19 0.11	Cv m2/yr SWELL 6 2 3.1 0 2			ange	T	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sampl Moisture Content (% 0.00 Mg/m3) Your Density (Mg/m3) Your D	) 3 6) 1. 1. 0.7 10 18 75	98 52 488 8.6 .68 .09	Pres 0 50 100 200 400		ange 50 100 200 400	Mv m2/MN -0.2 0.18 0.19 0.11 0.042	Cv m2/yr SWELL 6 2 3.1 0 2 0.98	Press			Mv m2/MN	Cv
0.70 0.69 0.68 0.67 0.66 1 Initial Sample Moisture Content (% Sulk Density (Mg/m3) Your Density (Mg/m	) 3 3) 1. 1. 0.7 10 18 75 (m3) 2.	98 52 488 8.6 .68 .09	Pres 0 50 100 200 400	ssure R	ange 50 100 200 400	Mv m2/MN -0.2 0.18 0.19 0.11	Cv m2/yr SWELL 6 2 3.1 0 2 0.98				Mv m2/MN	Cv m2/yr

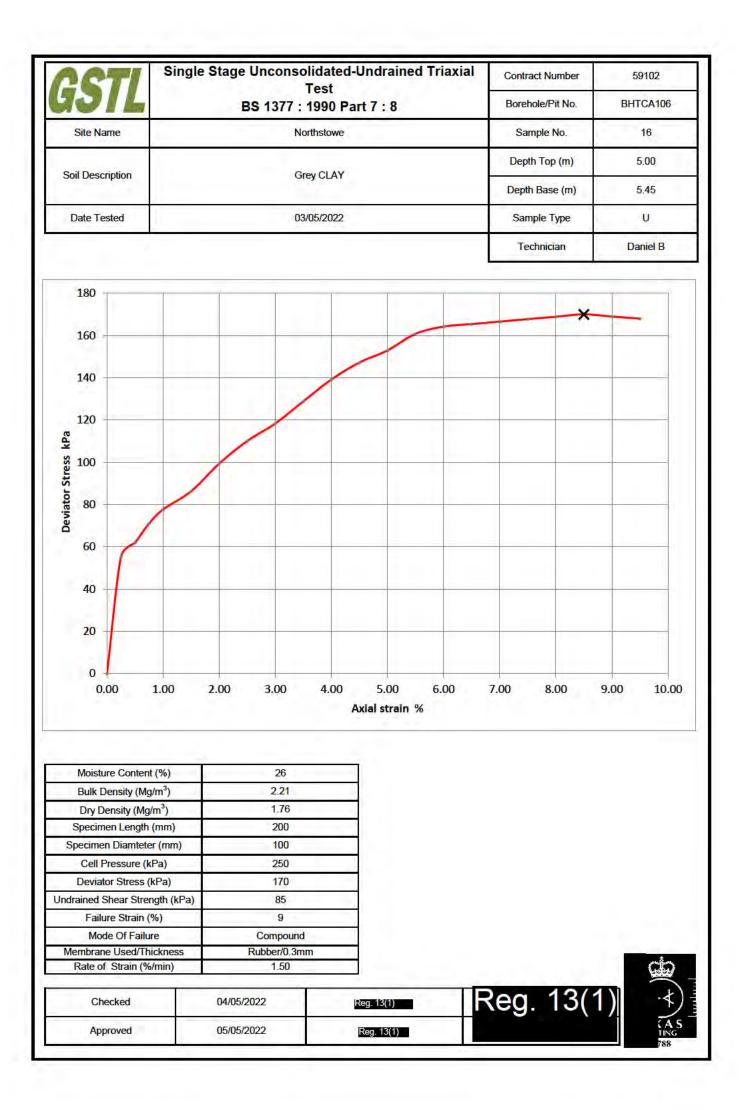


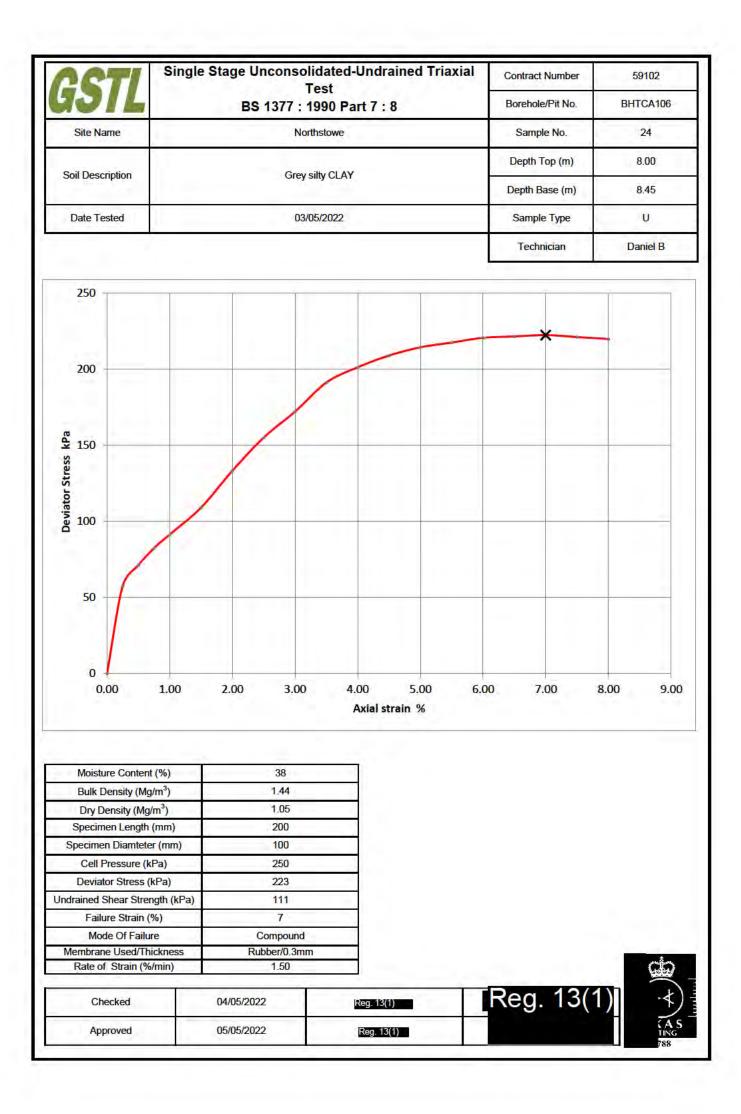


G	37/						ION TEST		Contract N	Number		59102	2
C.C	16		3513	77:Part 5	:1990	), clause	e 3		Borehole/Tr	rialpit N	0.	BHTCA1	106
Site Na	ime			North	stowe	al .			Sample No.				
Soil De	escription			Grey si	Ity CLA	Y			Depth To	op (m)		8.00	
			0.09 51	., 50				Depth Ba	ise (m)		8.45		
Lab Te	mperature			2	0°c				Sample L	ocation	01	Тор	
Remar	ks	Cv Calculat ity Assume	ed Usir d Unles	ng T90 ss Stated (	Otherwise		Sample	Туре		U			
Date T	Date Tested 26/04/2022												
0.88	6 <u>-</u>												-
	10 ms												
0.86							1						
0.04								1					
0.84													
0.82									1				
	_								1				
g 0.80	e						1			1			
0.80 0.80 0.78								1		1			
0.78								)		1			
0.76									1				
0.70										1			
0.74										1	1		
											1		
0.72													
0.70	1			10				10	00			1	000
					1	Pressure	- kPa						
	Initial Sample	Conditions		Pres	sure R	lange	Mv m2/MN	Cv m2/yr	Pre	ssure F	Range	Mv m2/MN	Cv m2/yr
1.5	Content (%)		33	0	-	50	0.0	SWELL		-			m2/yr
	nsity (Mg/m3)		.90	50	1811	100	0.24	19		$\left[ \left( \mathbf{v} \right) \right]$			
	sity (Mg/m3)		.43	100	1,64	200	0.25	12		1.6.	<u></u>	()	
/oids Ra			8580	200	5	400	0.20	0.7	_	1.12		-	
	of saturation		1.8	400	-	50	0.14	0.33		-			· · · · · · ·
leight (r			0.15			-		-		~	-		
Diamete	r (mm) Density (Mg/n		0.3 .65		041			-		-	-		
	Consity (Mg/II	2			1.2		_				10		сі́р
Ор	erators	Checked		04/0	5/2022		Reg. 13(1)		Re	g.	13(	1)	×)
-	. 13(1)	Approved		05/0	5/2022		Reg. 13(1)						AS TING
Reg													

Soil Description         Grey sitly CLAY         Depth Top (m)         13.00           Lab Temperature         20° c         Sample Location         Top           Remarks         Par Icle Density Assumed Unless Stated Otherwise         Sample Type         U           Date Tested         2604/2022              0.70         0.66         0.60              0.66         0.66                0.66         0.66                 0.66	CCTI	ONE					ION TEST		Contract N	umber		59102	
Soil Description         Dept Top (m)         13.00           Lab Temperature         20°c         Sample Location         Top           Remarks         Par icle Density Assumed Unless Stated Otherwise         Sample Type         U           Date Tested         2604/2022         Sample Type         U           0.00         0.00         Sample Type         U           0.00         0.00         Sample Type         U           0.00         0.00         0.00         Sample Type         U           0.00         0.00         0.00         0.00         0.00         0.00           0.00         0.00         Pressure - kPa         100         1000         1000           0.00         Pressure - kPa         0         1         50         0.3         100         1000           0 - 50         0.0         50         100         0.25         3.5         -         -         -         -           10 bonsity (Mym3)         1.60         0.00         2.00         2.5         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         <	USIL		BS137	7:Part 8	5:1990	, clause	9 3	В	Borehole/Trialpit No. BHTCA				06
Crey sity CLAY         Depth Base (m)         13.45           Lab Temperature         20°c         Sample Location         Top           Remarks         Paricle Density Assumed Using TS0 Paricle Density Assumed Usings Stated Otherwise         Sample Type         U           Date Tested         2604/2022         Image: Comparison of the compa	Site Name			Nort	hstowe	1			Sample	NO.		38	
Depth Base (m)         13.45           Lab Temperature         20°c         Sample Location         Top           Remarks         Particle Density Assume Unless Stated Otherwise         Sample Type         U           Date Tested         2604/2022          U           0.66	Soil Description			Greve		~			Depth Top	o (m)		13.00	
Remarks         CV Calculated Using T30 Pari ide Density Assumed Unless Stated Otherwise         Sample Type         U           Date Tested         2604/2022               U           0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		1.		Gieys					Depth Bas	e (m)	-115	13.45	
Netmans         Part (de Density Assumed Unless Stated Otherwise         Jampe Type         O           Date Tested         26/04/2022         0 <td>Lab Temperature</td> <td></td> <td></td> <td>2</td> <td>20°c</td> <td></td> <td></td> <td></td> <td>Sample Lo</td> <td>cation</td> <td>61</td> <td>Тор</td> <td></td>	Lab Temperature			2	20°c				Sample Lo	cation	61	Тор	
0.70         0.66         0.67         0.66 <th< td=""><td>Remarks</td><td>Pa</td><td>C r icle Densi</td><td>ty Calculat ty Assume</td><td>ted Usir d Unles</td><td>ng T90 is Stated (</td><td>Otherwise</td><td></td><td>Sample T</td><td>уре</td><td></td><td>U</td><td></td></th<>	Remarks	Pa	C r icle Densi	ty Calculat ty Assume	ted Usir d Unles	ng T90 is Stated (	Otherwise		Sample T	уре		U	
0.08       0.06	Date Tested	$t \ge 0$		26/0	4/2022	:2 =						5	
0.08       0.06	0.70	·					· · .						
0.66       0.64       0.62       0.66       0.64       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.66       0.67       0.67       0.66       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67       0.67	0.70												
0.64       0.62       0.64	0.68						•						
0.64       0.62       0.64	0.66							1					
0.62 0.60 0.58 0.54 0.54 0.50 0.50       0.61 0.58 0.54 0.54 0.54 0.50       0.00 0.58         0.50 0.50       10       100       100         Pressure - kPa         Mr m2/M M m2/M M m2/M M m2/M M m2/M M m2/M M m2/M M m2/M M m2/M m2/	0.00												
0.60       0.00       0.60	0.64							_	1				
0.60       0.00       0.60							٩		1				
0.58       0.56         0.54       0.52         0.50       1         10       100         Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Juk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       1         ry Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       1         rgree of saturation       115.8       400       -       50       0.13       1.1       -       1         iameter (mm)       50.21       -       -       -       -       -       -         Operators       Checked       04/05/2022       IE9 13(1)       Reg. 13(1)       Image: Checked       04/05/2022								1		1			
0.58       0.56         0.54       0.52         0.50       1         10       100         Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Juk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       1         ry Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       1         rgree of saturation       115.8       400       -       50       0.13       1.1       -       1         iameter (mm)       50.21       -       -       -       -       -       -         Operators       Checked       04/05/2022       IE9 13(1)       Reg. 13(1)       Image: Checked       04/05/2022	300									1			
0.58       0.56         0.54       0.52         0.50       1         10       100         Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         Juk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       1         ry Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       1         rgree of saturation       115.8       400       -       50       0.13       1.1       -       1         iameter (mm)       50.21       -       -       -       -       -       -         Operators       Checked       04/05/2022       IE9 13(1)       Reg. 13(1)       Image: Checked       04/05/2022	2 0.60								1	1			
0.56       0.54         0.52       0.50         0.50       10       100         10       100       1000         Pressure - kPa         İnitial Sample Conditions       Pressure Range       Mv m2/MN       Cv       Pressure Range       Mv m2/MN       CV         uk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       1         uk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       1       1         oids Ratio       0.66666       200       -       400       0.17       6.8       -       1       1         eight (mm)       19.9       -       1       -       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       -       1       1       1									1		1		
0.54       0.52         0.50       1       10       100       1000         Pressure - kPa         İnitial Sample Conditions       Pressure Range       Mv m2/Mk       Cv/m2/yr       Pressure Range       Mv m2/Mk       Cv/m2/yr         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -         vik Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -         vids Ratio       0.6566       200       -       400       0.17       6.8       -       <	0.58									1	1		
0.54       0.52         0.50       1       10       100       1000         Pressure - kPa         İnitial Sample Conditions       Pressure Range       Mv m2/Mk       Cv/m2/yr       Pressure Range       Mv m2/Mk       Cv/m2/yr         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -         vik Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -         vids Ratio       0.6566       200       -       400       0.17       6.8       -       <	0.56										1		
0.52       0.50       1       10       100       1000         Pressure - kPa         İnitial Sample Conditions       Pressure Range       Mv m2/MN       Cv       Pressure Range       Mv m2/MN       CV         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -         ulk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -         oids Ratio       0.6566       200       -       400       0.17       6.8       -       -       -         oids Ratio       0.6566       200       -       400       0.17       6.8       -       -       -         eight (mm)       19.9       - <td>0.30</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.30												
0.50       1       10       100       1000         Pressure - kPa         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV       Pressure Range       Mv m2/MN       CV         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -         ulk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -         ry Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       -       -         egree of saturation       115.8       400       -       50       0.13       1.1       -       -       -         iameter (mm)       19.9       - <td>0.54</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.54												
0.50       1       10       100       1000         Pressure - kPa         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV       Pressure Range       Mv m2/MN       CV         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -         ulk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -         ry Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       -       -         egree of saturation       115.8       400       -       50       0.13       1.1       -       -       -         iameter (mm)       19.9       - <td>0.52</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	0.52												
1       10       100       100         Pressure - kPa         Initial Sample Conditions       Pressure Range       Mv m2/MN       CV m2/yr       Pressure Range       Mv m2/MN       CV m2/yr         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -       -         ulk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -													
Pressure - kPa         Initial Sample Conditions       Pressure Range       Mv m2/MN       Cv m2/yr       Pressure Range       Mv m2/MN       Cv m2/yr         oisture Content (%)       29       0       -       50       -0.3       SWELL       -       -       -         uk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -       -       -       -         vy Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -		-							2				
Initial Sample Conditions         Pressure Range         MV m2/MN         m2/yr         Pressure Range         MV m2/MN         m2/yr           oisture Content (%)         29         0         -         50         -0.3         SWELL         -	1			10		Pressure	- kPa	10	U.			1	000
oisture Content (%)       29       0       -       50       -0.3       SWELL       - <td< td=""><td>Initial Sample</td><td>e Condition</td><td>s</td><td>Pres</td><td>ssure R</td><td>ange</td><td>Mv m2/MN</td><td></td><td>Pres</td><td>sure R</td><td>ange</td><td>Mv m2/MN</td><td></td></td<>	Initial Sample	e Condition	s	Pres	ssure R	ange	Mv m2/MN		Pres	sure R	ange	Mv m2/MN	
ulk Density (Mg/m3)       2.06       50       -       100       0.22       3.7       -	and the second second second			1	1-1		1.1	and the second		_			m2/yr
ny Density (Mg/m3)       1.60       100       -       200       0.25       3.5       -       <		-			17-1			the second second second second second second second second second second second second second second second se		-	1		
egree of saturation       115.8       400       -       50       0.13       1.1       -       -         eight (mm)       19.9       -       -       -       -       -       -       -         iameter (mm)       50.21       -       -       -       -       -       -       -         article Density (Mg/m3)       2.65       -       -       -       -       -       -         Operators       Checked       04/05/2022       Reg. 13(1)       Reg. 13(1)       Reg. 13(1)       -	ry Density (Mg/m3)	<u></u>	1.60	100	Le1	200	0.25	35		8		(j	
eight (mm)         19.9         -         <	oids Ratio			1.	191					1	1		
iameter (mm)         50.21         -				400	-	50	0.13	1,1		-			
Operators         Checked         04/05/2022         Reg. 13(1)         Reg. 13(1)		10								-	1		
Operators Checked 04/05/2022 Reg. 13(1) Reg. 13(1)		n2)		-				-	-			1	
Operators Checked 04/05/2022 Reg. 13(1) Reg. 13(1)	aruce Density (Mg/f	113/	2.00		-					23			cio
Reg. 13(1) Approved 05/05/2022 Reg. 13(1)	Operators	Chec	ked	04/0	5/2022		Reg. 13(1)		Reg		13(	1)	×)
		a Transfer		05/0	5/2022		Reg. 13(1)					71	2











### ANALYTICAL TEST REPORT

Contract no: 108536 Contract name: Northstowe Client reference: 59102 Clients name: Geo Site & Testing Services Clients address: Unit 3 and 4 Heol Aur Dafen Industrial Estate, Dafen Llanelli, Carmarthenshire SA14 80N Samples received: 25 April 2022 Analysis started: 25 April 2022 Analysis completed: 03 May 2022 Report issued: 03 May 2022

Key

- U UKAS accredited test
- M MCERTS & UKAS accredited test
- \$ Test carried out by an approved subcontractor
- I/S Insufficient sample to carry out test
- N/S Sample not suitable for testing

Approved by:



Senior Reporting Administrator

# SOLLS

h			r	r		r		r
Lab number			108536-1	108536-2	108536-3	108536-4	108536-5	108536-6
Sample id			BHTCA105	BHTCA106	BHTCA106	BHTCA106	BHTCA106	BHTCA106
Depth (m)			0.10-0.50	0.20-0.40	1.70-2.00	4.00-4.50	7.00-7.50	14.50-15.00
Sample Type			B1	B1	B5	B14	B22	B43
Date sampled						-	-	-
Test	Method	Units						
pН	CEOO4 U	un ts	7.8	8.4	8.1	8.6	8.3	8.5
Magnesium (2:1 water soluble)	CE061	mg/l Mg	5.1	31	8.2	17	28	17
Chloride (2:1 water soluble)	CE049 U	mg/I CI	6.7	23	88	24	26	20
Nitrate (2:1 water soluble)	CE049 U	mg/I NO <sub>3</sub>	3.9	6.9	10	2.5	2.0	2.8
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	74	709	198	420	655	481
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	433	3777	856	826	3793	2959
Sulphur (total)	CE119	mg/kg S	594	7909	774	6351	12282	9993
Sulphur (total)	CE119	% w/w S	0.06	0.79	0.08	0.64	1.23	1.00

# SOLLS

h			
Lab number			108536-7
Sample id			BHTCA106
Depth (m)			16.50-17.00
Sample Type			B48
Date sampled	-		
Test	Method	Units	
рН	CE004 <sup>U</sup>	un ts	8.3
Magnesium (2:1 water soluble)	CE061	mg/I Mg	17
Chloride (2:1 water soluble)	CE049 <sup>U</sup>	mg/I CI	60
Nitrate (2:1 water soluble)	CE049 <sup>U</sup>	mg/I NO <sub>3</sub>	5.9
Sulphate (2:1 water soluble)	CE061 <sup>U</sup>	mg/I SO <sub>4</sub>	638
Sulphate (total)	CE062 <sup>U</sup>	mg/kg SO <sub>4</sub>	2263
Sulphur (total)	CE119	mg/kg S	12399
Sulphur (total)	CE119	% w/w S	1.24

# METHOD DETAILS

METHOD	SOLLS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	рН	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/I Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/I CI
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/I NO <sub>3</sub>
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/I SO <sub>4</sub>
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO <sub>4</sub>
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

### DEVIATING SAMPLE INFORMATION

#### Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

- N No (not deviating sample)
- Y Yes (deviating sample)
- NSD Sampling date not provided
- NST Sampling time not provided (waters only)
- EHT Sample exceeded holding time(s)
- IC Sample not received in appropriate containers
- HP Headspace present in sample container
- NCF Sample not chemically fixed (where appropriate)
- OR Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
108536-1	BHTCA105	0.10-0.50	Y	AII (NSD)
108536-2	BHTCA106	0.20-0.40	Y	AII (NSD)
108536-3	BHTCA106	1.70-2.00	Y	AII (NSD)
108536-4	BHTCA106	4.00-4.50	Y	AII (NSD)
108536-5	BHTCA106	7.00-7.50	Y	AII (NSD)
108536-6	BHTCA106	14.50-15.00	Y	AII (NSD)
108536-7	BHTCA106	16.50-17.00	Y	All (NSD)

### ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope. Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling. All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing. Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

# APPENDIX G

GEO-ENVIRONMENTAL LABORATORY TEST DATA



Reg. 13(1) Arcadis Consulting (UK) Ltd HCL House St Mellon's Business Park Cardiff CF3 OEY Environmental Science

i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

t: 01923 225404 f: 01923 237404 e: reception@i2analytical.com

t: 029 2092 6873

e: Reg. 13(1) arcadis.com

### Analytical Report Number : 22-45875

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	3 soil samples		



Reg. 13(1) Technical Reviewer (Reporting Team) For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	-	4 weeks from reporting
leachates	-	2 weeks from reporting
waters	-	2 weeks from reporting
asbestos	-	6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





#### Analytical Report Number: 22-45875 Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	2206534	2206535	2206536			
Sample Reference	BHTCA101	BHTCA202	BHTCA202			
Sample Number				2	1	3
Depth (m)				0.50	0.20	1.00
Date Sampled	09/03/2022	09/03/2022	09/03/2022			
Time Taken	1437	1440	1442			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	26	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.6	17	14
Total mass of sample received	kg	0.001	NONE	1	1	1

# General Inorganics pH - Automated pH Units N/A MCERTS 9.5 8.8 8.2 Fraction Organic Carbon (FOC) Automated N/A 0.001 MCERTS 0.011 0.007 0.0059

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	17	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	27	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	15	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	18	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	28	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61	61	59

#### Petroleum Hydrocarbons

TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1
TPH Texas (C8 - C10) HS 1D TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4 0	< 4.0	< 4.0
TPH Texas (C16 - C21) EH CU 1D TOTAL	mg/kg	10	MCERTS	11	< 10	< 10
TPH Texas (C21 - C40) EH CU 1D TOTAL	mg/kg	10	MCERTS	21	< 10	< 10
TPH Texas (C6 - C40) <sub>EH_CU+HS_1D_TOTAL</sub>	mg/kg	10	NONE	32	< 10	< 10





Analytical Report Number: 22-45875 Project / Site name: Northstowe Your Order No: 14059900

Lab Sample Number				2206534	2206535	2206536
Sample Reference				BHTCA101	BHTCA202	BHTCA202
Sample Number				2	1	3
Depth (m)				0.50	0.20	1.00
Date Sampled				09/03/2022	09/03/2022	09/03/2022
Time Taken				1437	1440	1442
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
SVOCs	4	-	<u> </u>			
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0 2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS MCERTS	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1		< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.05	MCERTS MCERTS	< 0.1	< 0.1	< 0.1
Acenaphthylene Acenaphthene	mg/kg mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.03	MCERTS	< 0.22	< 0.03	< 0.03
Dibenzofuran	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.2	ISO 17025	< 0.3	< 0.2	< 0.2
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	2.1	0 6	0.22
Anthracene	mg/kg	0.05	MCERTS	0.44	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	5	1.4	0.49
Pyrene	mg/kg	0.05	MCERTS	5.3	1.4	0.49
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0 3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.6	0.67	0.2
Chrysene	mg/kg	0.05	MCERTS	2.2	0.67	0.24
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.1	0.78	0.31
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.1	0.35	0.07
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.5	0.57	0.23





#### Analytical Report Number: 22-45875 Project / Site name: Northstowe Your Order No: 14059900

Lab Sample Number	2206534	2206535	2206536			
Sample Reference	BHTCA101	BHTCA202	BHTCA202			
Sample Number				2	1	3
Depth (m)				0.50	0.20	1.00
Date Sampled				09/03/2022	09/03/2022	09/03/2022
Time Taken	1437	1440	1442			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.29	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.39	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample





#### Analytical Report Number : 22-45875

#### Project / Site name: Northstowe

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2206534	BHTCA101	2	0.5	Brown clay and sand with gravel and stones.
2206535	BHTCA202	1	0.2	Grey clay and sand with gravel.
2206536	BHTCA202	3	1	Brown clay and sand with gravel.





#### Analytical Report Number : 22-45875 Project / Site name: Northstowe

#### Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.		L064-PL	D	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in the onlited Kingdom. For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

#### **Information in Support of Analytical Results**

#### List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame lonisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e g. EH+HS_Total or EH_CU+HS_Total



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### Analytical Report Number : 22-45878

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	10052307	Samples instructed on/ Analysis started on:	16/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	4 soil samples		



Reg. 13(1) Technical Reviewer (Reporting Team) For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland. Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation. Standard sample disposal times, unless otherwise agreed with the laboratory, are : soils eachates - 2 weeks from reporting waters - 2 weeks from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





#### Analytical Report Number: 22-45878 Project / Site name: Northstowe

Your Order No: 14059900	
Lab Sample Number	
Sample Reference	
Sample Number	

Sample Reference	BHTCA102	BHTCA103	BHTCA103A	BHTCA103A			
Sample Number		2	1	3	6		
Depth (m)		0.50	0.20	1.00	2.00		
Date Sampled		10/03/2022	10/03/2022	10/03/2022	10/03/2022		
Time Taken	1539	1455	1612	1705			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	28	< 0.1
Moisture Content	%	0.01	NONE	14	10	9.6	11
Total mass of sample received	-	0.001	NONE	1	10	9.0 1	1
	kg	0.001	NONE	1	1	1	1
Asbestos in Soil	Turno	N/A	ISO 17025	-	Not-detected	-	-
	Туре			-		-	-
Asbestos Analyst ID	N/A	N/A	N/A		NTK		
Concern Incorporation							
General Inorganics	add the 2 -	N1/A	MCEDIC	71	77	10.4	0.0
pH - Automated	pH Units		MCERTS	- 7.1	7.7	- 10.4	- 8.9
Total Cyanide	mg/kg	1	MCERTS		< 1.0		
Free Cyanide Water Soluble SO4 16hr extraction (2:1 Leachate	mg/kg	1	MCERTS	-	< 1.0	-	-
Equivalent)	g/l	0.00125	MCERTS	-	0.53	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.009	-	0.011	< 0.0010
	· ·						
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-
	0, 0						
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	0.23	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	1.7	-	-
Anthracene	mg/kg	0.05	MCERTS	-	0.42	_	-
Fluoranthene	mg/kg	0.05	MCERTS		4 5		-
	mg/kg	0.05	MCERTS		3.9	-	
Pyrene Benze (a)anthrogene		0.05	MCERTS	-	2 2	-	-
Benzo(a)anthracene	mg/kg						
Chrysene	mg/kg	0.05	MCERTS	-	16	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	16	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	13	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1.9	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.99	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.25	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.99	-	-
					24.6		
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	21.6	-	-
Honey Motole / Motolloida							
Heavy Metals / Metalloids	n //	4	MCERTS	15	10	14	45
Arsenic (aqua regia extractable)	mg/kg	1		- 15	18	- 14	- 15
Boron (water soluble)	mg/kg	0.2	MCERTS		1.9		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	06	0.5	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	23	23	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	17	22	9.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	19	25	7.5
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3
Nickel (agua regia extractable)	ma/ka	1	MCEDIC	23	22	21	16

MCERTS

MCERTS

MCERTS

23

< 1 0

71

22

< 1.0

63

21

< 1.0

82

16

< 1.0

28

2206546

2206547

2206548

2206549

mg/kg

mg/kg

mg/kg

1

1

1

Nickel (aqua regia extractable)

Zinc (aqua regia extractable)

Selenium (aqua regia extractable)





#### Analytical Report Number: 22-45878 Project / Site name: Northstowe

Your Order No: 14059900

Lab Sample Number	Lab Sample Number						2206549
Sample Reference				BHTCA102	BHTCA103	BHTCA103A	BHTCA103A
Sample Number				2	1	3	6
Depth (m)				0.50	0.20	1.00	2.00
Date Sampled				10/03/2022	10/03/2022	10/03/2022	10/03/2022
Time Taken				1539	1455	1612	1705
Analytical Parameter (Soil Analysis)							
Petroleum Hydrocarbons	-		-				
TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	-	< 0.1	< 0.1
TPH Texas (C8 - C10) HS 1D TOTAL	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
TPH Texas (C10 - C12) EH CU 1D TOTAL	mg/kg	1	MCERTS	< 1 0	-	< 1.0	< 1.0
TPH Texas (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4 0	-	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	-	10	< 10
TPH Texas (C21 - C40) EH CU 1D TOTAL	mg/kg	10	MCERTS	25	-	26	< 10
TPH Texas (C6 - C40) <sub>EH_CU+HS_1D_TOTAL</sub>	mg/kg	10	NONE	25	-	36	< 10





Analytical Report Number: 22-45878 Project / Site name: Northstowe Your Order No: 14059900

Lab Sample Number				2206546	2206547	2206548	2206549
Sample Reference	BHTCA102	BHTCA103	BHTCA103A	BHTCA103A			
Sample Number		2	1	3	6		
Depth (m)		0.50	0.20	1.00	2.00		
Date Sampled	10/03/2022	10/03/2022	10/03/2022	10/03/2022			
Time Taken				1539	1455	1612	1705
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
SVOCs			•				
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0 2	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0 2	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
2,4-Dichlorophenol 4-Chloroaniline	mg/kg	0.3	MCERTS NONE	< 0.3	-	< 0.3	< 0.3
Hexachlorobutadiene	mg/kg mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1		< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0 3	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0 2	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.6	-	0.47	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.25	-	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0 3	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	2.9	-	1.5	< 0.05
Pyrene Butyl benzyl phthalate	mg/kg	0.05	MCERTS ISO 17025	2.7 < 0 3	-	1.5 < 0.3	< 0.05 < 0.3
Butyi benzyi primalate Benzo(a)anthracene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3
Chrysene	mg/kg	0.05	MCERTS	1.7		0.76	< 0.05
Enrysene Benzo(b)fluoranthene	mg/kg mg/kg	0.05	MCERTS	1.2	-	0.73	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.5	-	0.39	< 0.05
	-						
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	-	0.77	< 0.05

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Analytical Report Number: 22-45878 Project / Site name: Northstowe Your Order No: 14059900

Lab Sample Number		2206546	2206547	2206548	2206549		
Sample Reference				BHTCA102	BHTCA103	BHTCA103A	BHTCA103A
Sample Number				2	1	3	6
Depth (m)				0.50	0.20	1.00	2.00
Date Sampled				10/03/2022	10/03/2022	10/03/2022	10/03/2022
Time Taken				1539	1455	1612	1705
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.8	-	0.36	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1	-	0.45	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample





#### Analytical Report Number : 22-45878

#### Project / Site name: Northstowe

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2206546	BHTCA102	2	0.5	Brown clay and sand with gravel.
2206547	BHTCA103	1	0.2	Brown clay and sand with gravel.
2206548	BHTCA103A	3	1	Brown clay and sand with stones and gravel
2206549	BHTCA103A	6	2	Brown clay and sand with gravel.





# Analytical Report Number : 22-45878 Project / Site name: Northstowe

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	w	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	w	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodiun hydroxide followed by distillation followed by colorimetry.		L080-PL	w	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS





#### Analytical Report Number : 22-45878 Project / Site name: Northstowe

#### Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture

correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

#### Information in Support of Analytical Results

#### List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e g. EH+HS_Total or EH_CU+HS_Total



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### Analytical Report Number : 22-45879

Project / Site name:	Northstowe	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	3 soil samples		



Reg. 13(1)

asbestos - 6 months from reporting

Technical Reviewer (Reporting Team) For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland. Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation. Standard sample disposal times, unless otherwise agreed with the laboratory, are : soils eachates - 2 weeks from reporting waters - 2 weeks from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Your Order No: 14059900

Lab Sample Number				2206550	2206551	2206552
Sample Reference				WSTCA109	WSTCA112	WSTCA116
Sample Number				2	2	1
Depth (m)				0.50	0.50	0.10
Date Sampled				14/03/2022	14/03/2022	14/03/2022
Time Taken				1532	1515	1516
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	11	13
Total mass of sample received	kg	0.001	NONE	1.5	15	1.5
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	PDO
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	8.2	8.1	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
Water Soluble SO4 160r extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.1	0.11	2
Total Phenois	51.				0.11	_
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.66	< 0.05	0.47
Anthracene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	< 0.05	1.2
Pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.55	< 0.05	0.69
Chrysene	mg/kg	0.05	MCERTS	0.54	< 0.05	0.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.6	< 0.05	0.69
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.36	< 0.05	0.56
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.5	< 0.05	0.84
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.41
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.35	< 0.05	0.47
				0.00		0.1.7
				c		
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.75	< 0.80	7.2
Heavy Metals / Metalloids		1				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	14	16
Boron (water soluble)	mg/kg	0.2	MCERTS	3	0.9	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	29	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	17	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	19	26
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	20	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67	58	66





#### Analytical Report Number : 22-45879

#### Project / Site name: Northstowe

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2206550	WSTCA109	2	0.5	Brown clay and sand with gravel.
2206551	WSTCA112	2	0.5	Brown clay and sand with gravel.
2206552	WSTCA116	1	0.1	Brown clay and sand with gravel.





Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	w	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodiun hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	w	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



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### Analytical Report Number : 22-45898

Project / Site name:	Northstowe Boreholes	Samples received on:	15/03/2022
Your job number:	NSTO	Samples instructed on/ Analysis started on:	15/03/2022
Your order number:	14059900	Analysis completed by:	24/03/2022
Report Issue Number:	1	Report issued on:	24/03/2022
Samples Analysed:	17 soil samples		



Reg. 13(1) Technical Reviewer (Reporting Team) For & on behalf of i2 Analytical Ltd.

asbestos - 6 months from reporting

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Lab Sample Number				2206630	2206631	2206632	2206633	2206634
Sample Reference				TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number				1	2	4	2	1
Depth (m)				0 00-0.20	0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	10/03/2022	11/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	35	20	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	11	8	11	11
Total mass of sample received	kg	0.001	NONE	2	2	2	1.4	1
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ		SSZ	SSZ	SSZ
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.7	9.7	8.3	8.1	8.1
Total Cyanide	mg/kg	1	MCERTS	< 10	-	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1 0	-	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.034	-	0.1	0 066	0.23
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	0.0078	-	-	-
Total Phenols Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1 0	-	< 1.0	< 1.0	< 1.0
Speciated PAHs				0.05		0.05	0.05	0.05
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	· ·	< 0.05		< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS MCERTS	< 0.05	-	< 0.05	0.26	< 0.05
Anthracene	mg/kg mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05 0.37	< 0.05 0.39
Fluoranthene		0.05	MCERTS	< 0.05	-	< 0.05		0.39
Pyrene Ronzo(a)anthracana	mg/kg	0.05	MCERTS	< 0.05		< 0.05	0.35 0.31	0.37
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.31	0.27
Chrysene Benzo(b)fluoranthene	mg/kg mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.22	0.19
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.3	0.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	0.35	0.22
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	_	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	_	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05		< 0.05	< 0.05	< 0.05
	ing/kg	0.03	MULKIS	< 0.05		< 0.05	< 0.05	< 0.03
Total PAH Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	< 0.80	2.36	1.91
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Lab Sample Number				2206630	2206631	2206632	2206633	2206634
Sample Reference				TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number				1	2	4	2	1
Depth (m)				0 00-0.20	0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20
Date Sampled		10/03/2022	10/03/2022	10/03/2022	11/03/2022	10/03/2022		
Time Taken		None Supplied	None Supplied	None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids				-				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	18	27	17	14
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	-	0.3	0.5	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	27	24	26	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	17	11	24	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	23	10	24	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	23	27	23	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	58	39	62	64

TPH Texas (C6 - C8) HS_1D_TOTAL	mg/kg	0.1	ISO 17025	-	< 0.1	-	-	-
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH Texas (C10 - C12) EH CU 1D TOTAL	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH Texas (C12 - C16) EH CU 1D TOTAL	mg/kg	4	MCERTS	-	12	-	-	-
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	37	-	-	-
TPH Texas (C21 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	-	85	-	-	-
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-	130	-	-	-





Lab Sample Number				2206630	2206631	2206632	2206633	2206634
Sample Reference				TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111
Sample Number				1	2	4	2	1
Depth (m) Date Sampled				0 00-0.20 10/03/2022	0.20-0.50 10/03/2022	1.00-2.00	0.20-0.50 11/03/2022	0.00-0.20
Time Taken								None Supplied
	1		<u> </u>	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs	<b></b>	2	<u> </u>		<u></u>			I
Aniline	mg/kg	0.1	NONE	-	< 0.1	_	-	
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Hexachlorobutadiene 4-Chloro-3-methylphenol	mg/kg	0.1	MCERTS NONE	-	< 0.1		-	-
2,4,6-Trichlorophenol	mg/kg mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.2	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	2 3	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	0.7	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3 9 8	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	9.8	-	-	-
Pyrene Rubul benzul obthalate	mg/kg	0.05	MCERTS	-	9.9 < 0.3	-	-	-
Butyl benzyl phthalate Benzo(a)anthracene	mg/kg mg/kg	0.3	ISO 17025 MCERTS		< 0.3 6.4		-	-
Chrysene	mg/kg mg/kg	0.05	MCERTS	-	3 8	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	5.1	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS		3	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	5.7	-	-	-
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Your Order No: 14059900

Lab Sample Number				2206630	2206631	2206632	2206633	2206634
Sample Reference		TPTCA102	TPTCA103	TPTCA103	TPTCA107	TPTCA111		
Sample Number		1	2	4	2	1		
Depth (m)	0 00-0.20	0.20-0.50	1.00-2.00	0.20-0.50	0.00-0.20			
Date Sampled		10/03/2022	10/03/2022	10/03/2022	11/03/2022	10/03/2022		
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	28	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.62	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	2.9	-	-	-





Speciated Total EPA-16 PAHs

Your Order No: 14059900

Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1	3	1	3
Depth (m)				0 00-0.20	0.00-0.20	0.50-1.00	0.00-0.20	0.50-1.00
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	14	14	11	16
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	1.4	1.4
Asbestos in Soil	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	8 5	8.4	8.7	7.9
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0095	0 0064	0.0039	0 008	0.0015
Total Phenols		T						
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene Phenanthrene	mg/kg	0.05	MCERTS MCERTS	-	-		-	-
Anthracene	mg/kg	0.05	MCERTS	-	-		-	-
Fluoranthene	mg/kg mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-		-	-	-
Chrysene	mg/kg	0.05	MCERTS	-		-	-	-
Enrysene Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-			-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-		-	-
	iiig/ kg	0.05	PICENTS	-	_	_	_	_
Total PAH								

mg/kg

0.8

MCERTS





Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1 0.00-0.20	3 0.50-1.00	1	3
Depth (m)				0 00-0.20			0.00-0.20	0.50-1.00
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids					-	-		-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	14	18	14	13
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	24	32	25	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	15	17	16	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	21	15	22	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	21	30	21	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	55	50	56	46
Zinc (aqua regia extractable) Petroleum Hydrocarbons					-		-	
TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TDU Taura (C0 C10)		0.4	MOEDTO	. 0.1	. 0.1	. 0.1	. 0.1	. 0.1

TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) EH CU 1D TOTAL	mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
TPH Texas (C12 - C16) EH CU 1D TOTAL	mg/kg	4	MCERTS	< 4 0	< 4.0	< 4.0	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	12	< 10	< 10	< 10	< 10
TPH Texas (C21 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	43	23	< 10	29	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	55	23	< 10	29	< 10





Your Order No: 14059900

Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1	3	1	3
Depth (m)				0 00-0.20	0.00-0.20	0.50-1.00	0.00-0.20	0.50-1.00
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene 2,4-Dinitrotoluene	mg/kg	0.05	MCERTS MCERTS	< 0.05 < 0 2	< 0.05 < 0.2	< 0.05 < 0.2	< 0.05	< 0.05 < 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diethyl phthalate	mg/kg	0.3	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.02
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	0.25	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
Carbazole	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.38	0.73	< 0.05	0.75	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.4	0.77	< 0.05	0.74	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.26	0.46	< 0.05	0.57	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.25	0.47	< 0.05	0.47	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.54	0.63	< 0.05	0.69	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.49	0.29	< 0.05	0.35	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.31	0.59	< 0.05	0.61	< 0.05

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Your Order No: 14059900

Lab Sample Number				2206635	2206636	2206637	2206638	2206639
Sample Reference				TPTCA113	TPTCA114	TPTCA114	TPTCA118	TPTCA118
Sample Number				1	1	3	1	3
Depth (m)		0 00-0.20	0.00-0.20	0.50-1.00	0.00-0.20	0.50-1.00		
Date Sampled				11/03/2022	11/03/2022	11/03/2022	10/03/2022	10/03/2022
Time Taken			None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	03	< 0.05	0.31	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.39	< 0.05	0.38	< 0.05





Speciated Total EPA-16 PAHs

Your Order No: 14059900

Lab Sample Number				2206640	2206641	2206642	2206643	2206644
Sample Reference				TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number				2	1	2	2	1
Depth (m)				0 20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	4.3	16	< 0.1
Moisture Content	%	0.01	NONE	14	15	14	10	12
Total mass of sample received	kg	0.001	NONE	1	1	1.5	1.5	0.4
Asbestos in Soil	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	78	7.7	8.7	8.4
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.011	0 0045	0.0041	0 013	0.0075
Total Phenols		-	-					
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
Speciated PAHs Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS		-		-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Total PAH					-		-	

mg/kg

0.8

MCERTS





			2206640	2206641	2206642	2206643	2206644
			TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
			2	1	2	2	1
			0 20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
			10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
			None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Units	Limit of detection	Accreditation Status					
				-		-	
mg/kg	1	MCERTS	13	14	15	15	16
mg/kg	0.2	MCERTS	-	-	-	-	-
mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	1.4
mg/kg	4	NONE	< 4 0	< 4.0	< 4.0	< 4.0	< 4.0
mg/kg	1	MCERTS	23	27	29	27	26
mg/kg	1	MCERTS	16	16	14	22	22
mg/kg	1	MCERTS	19	22	17	160	21
mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
mg/kg	1	MCERTS	19	25	27	20	23
mg/kg	1	MCERTS	< 1 0	< 1.0	< 1.0	< 1.0	< 1.0
mg/kg	1	MCERTS	58	63	51	76	69
	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	S         S           mg/kg         1           mg/kg         0.2           mg/kg         0.2           mg/kg         1           mg/kg         1	SignalSignalImageImageImage1Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image0.2Image1Image1Image1Image0.3Image1Image1Image1Image1Image1Image1Image1Image1Image1Image1Image1	Z           0 20-0.50           10/03/2022           None Supplied           Initian of the construction of the constru	2         1           0 20-0.50         0.20-0.50           10/03/2022           None Supplied           None Supplied           None Supplied           Structure           None Supplied           None Supplied           More Supplied           More Supplied           More Supplied           mg/kg           MCERTS           mg/kg           0.2           Mg/kg         0.2           MCERTS         -           mg/kg         0.2           Mg/kg         0.2           Mg/kg         0.2           MCERTS         -           mg/kg         1           MCERTS         -           mg/kg         1           MCERTS         23           mg/kg         1           MCERTS         16           mg/kg         1           MCERTS         19           22         mg/kg           mg/kg         1           MCERTS         19	2         1         2           0 20-0.50         0.20-0.50         0.20-0.50           10/03/2022         10/03/2022         09/03/2022           None Supplied         None Supplied         None Supplied           View         Statistic         None Supplied         None Supplied           Mitric         Statistic         Statistic         None Supplied         None Supplied           Mitric         Statistic         Statistic         Statistic         None Supplied         None Supplied           Mitric         Statistic         Statistic         Statistic         Statistic         Statistic           Mitric         Mitric         Statistic         Statistic         Statistic         Statistic           Mitric         Mitric         Statistic         Statistic         Statistic         Statistic           Mitric         Mitric         Mitric         Statistic         Statistic         Statistic           Mitric         Mitric         Mitric         Statistic         Statistic         Statistic           Mitric         Mitric         Mitric         Statistic         Statistic         Statistic         Statistic           Mitric         Mitric         Statis         Statistic	Image: constraint of the sector of

TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH Texas (C10 - C12) EH CU 1D TOTAL	mg/kg	1	MCERTS	< 10	< 1.0	< 1.0	< 1.0	< 1.0
TPH Texas (C12 - C16) EH CU 1D TOTAL	mg/kg	4	MCERTS	< 4 0	< 4.0	< 4.0	< 4.0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	16	< 10
TPH Texas (C21 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	22	< 10	< 10	30	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	22	< 10	< 10	45	< 10





Your Order No: 14059900

Lab Sample Number				2206640	2206641	2206642	2206643	2206644
Sample Reference				TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number				2	1	2	2	1
Depth (m)				0 20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20
Date Sampled				10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
		Ξ.		None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs		-						
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0 05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05 < 0.2	< 0.05 < 0.2	0.25	< 0 05 < 0.2
2,4-Dinitrotoluene Dibenzofuran	mg/kg	0.2	MCERTS MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg mg/kg	0.2	ISO 17025	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Diethyl phthalate	mg/kg	0.3	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.2	MCERTS	< 0.05	< 0.05	< 0.2	0.24	< 0.2
Azobenzene	mg/kg	0.05	MCERTS	< 0.05	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.2	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.79	03	< 0.05	2.6	2.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.82	< 0 05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.61	< 0.05	5.9	2
Pyrene	mg/kg	0.05	MCERTS	1.1	0.66	< 0.05	5.5	1.6
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0 3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.58	0.34	< 0.05	3.2	0.52
Chrysene	mg/kg	0.05	MCERTS	0.47	0.28	< 0.05	3	0.55
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.65	0.38	< 0.05	4.3	0.66
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	0 2	< 0.05	1.7	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.55	0.36	< 0.05	3.8	0.46

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Your Order No: 14059900

Lab Sample Number				2206640	2206641	2206642	2206643	2206644
Sample Reference				TPTCA120	TPTCA201	TPTCA205	TPTCA206	TPTCA208
Sample Number				2	1	2	2	1
Depth (m)			0 20-0.50	0.20-0.50	0.20-0.50	0.50-1.00	0.00-0.20	
Date Sampled	•			10/03/2022	10/03/2022	09/03/2022	09/03/2022	10/03/2022
Time Taken	Taken		None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05	1.9	0.26
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.56	< 0 05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	2.4	0.28





Lab Sample Number				2206645	2206646			
Sample Reference				TPTCA208	TPTCA208			
Sample Number				3	5			
Depth (m)				0 50-1.00	2.00-3.00			
Date Sampled	ate Sampled							
Time Taken	None Supplied	None Supplied						
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	0.01	NONE	18	16			
Total mass of sample received	kg	0.001	NONE	0.4	0.4			
Asbestos in Soil	Туре	N/A	ISO 17025	-	-			
Asbestos Analyst ID	N/A	N/A	N/A					

#### **General Inorganics**

pH - Automated	pH Units	N/A	MCERTS	8	78
Total Cyanide	mg/kg	1	MCERTS	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0056	0 0041

#### **Total Phenols**

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-

Total PAH

Total FAI					
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-





### Your Order No: 14059900

Lab Sample Number	2206645	2206646			
Sample Reference		TPTCA208	TPTCA208		
Sample Number				3	5
Depth (m)				0 50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	12
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Chromium (hexavalent)	mg/kg	4	NONE	< 4 0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1 0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	58

#### Petroleum Hydrocarbons

TPH Texas (C6 - C8) <sub>HS_1D_TOTAL</sub>	mg/kg	0.1	ISO 17025	< 0.1	< 0.1
TPH Texas (C8 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH Texas (C10 - C12) EH CU 1D TOTAL	mg/kg	1	MCERTS	< 10	< 1.0
TPH Texas (C12 - C16) EH CU 1D TOTAL	mg/kg	4	MCERTS	< 4 0	< 4.0
TPH Texas (C16 - C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10
TPH Texas (C21 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10
TPH Texas (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	< 10	< 10





Project / Site name: Northstowe Boreholes Your Order No: 14059900

Lab Sample Number	2206645	2206646			
Sample Reference				TPTCA208	TPTCA208
Sample Number	3	5			
Depth (m)				0 50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
SVOCs					
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0 2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0 2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0 2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0 2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0 3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dichlorophenol 4-Chloroaniline	mg/kg	0.3	MCERTS	< 0.3	< 0.3 < 0.1
Hexachlorobutadiene	mg/kg mg/kg	0.1	NONE MCERTS	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0 2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0 3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0 3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0 2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene Rutud bonzud obtholoto	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Butyl benzyl phthalate Benzo(a)anthracene	mg/kg	0.3	ISO 17025	< 0.3	< 0.3
Benzo(a)anthracene Chrysene	mg/kg	0.05	MCERTS	< 0.05 < 0.05	< 0.05 < 0.05
Enrysene Benzo(b)fluoranthene	mg/kg mg/kg	0.05	MCERTS MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Denzo(u)pyrene		0.00	TIGEN 13	~ 0.03	~ 0.05

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Your Order No: 14059900

Lab Sample Number	2206645	2206646			
Sample Reference				TPTCA208	TPTCA208
Sample Number				3	5
Depth (m)				0 50-1.00	2.00-3.00
Date Sampled				10/03/2022	10/03/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05





### Analytical Report Number : 22-45898

#### Project / Site name: Northstowe Boreholes

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2206630	TPTCA102	1	0.00-0.20	Brown clay and sand with gravel.
2206631	TPTCA103	2	0.20-0.50	Brown clay and sand with stones and gravel
2206632	TPTCA103	4	1.00-2.00	Brown clay and sand with stones and gravel
2206633	TPTCA107	2	0.20-0.50	Brown clay and sand with gravel.
2206634	TPTCA111	1	0.00-0.20	Brown clay and sand with gravel.
2206635	TPTCA113	1	0.00-0.20	Brown clay and sand with gravel.
2206636	TPTCA114	1	0.00-0.20	Brown clay and sand with gravel.
2206637	TPTCA114	3	0.50-1.00	Brown clay and sand with gravel.
2206638	TPTCA118	1	0.00-0.20	Brown clay and sand with gravel.
2206639	TPTCA118	3	0.50-1.00	Brown clay and sand with gravel.
2206640	TPTCA120	2	0.20-0.50	Grey clay and sand with gravel.
2206641	TPTCA201	1	0.20-0.50	Brown clay and sand with gravel.
2206642	TPTCA205	2	0.20-0.50	Brown clay and sand with stones and gravel
2206643	TPTCA206	2	0.50-1.00	Brown clay and loam with stones and gravel
2206644	TPTCA208	1	0.00-0.20	Brown clay and sand with gravel.
2206645	TPTCA208	3	0.50-1.00	Grey clay and sand with gravel.
2206646	TPTCA208	5	2.00-3.00	Grey clay and sand with gravel.





Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	w	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.		L080-PL	w	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.		L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS





### Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
	colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Texas (Soil)	TPH Texas bands C6-C10 by HS/GC-MS & C10-C40 by GC FID	In-house method	L088/L076	D	MCERTS
	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

#### Information in Support of Analytical Results

#### List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e g. EH+HS_Total or EH_CU+HS_Total





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### Analytical Report Number : 22-46172

Project / Site name:	Northstowe	Samples received on:	16/03/2022	
Your job number:	10052307	Samples instructed on/ Analysis started on:	16/03/2022	
Your order number:	14059900	Analysis completed by:	25/03/2022	
Report Issue Number:	1	Report issued on:	25/03/2022	
Samples Analysed:	4 soil samples			



Technical Reviewer (Reporting Team) For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

<ul> <li>4 weeks from reporting</li> </ul>
- 2 weeks from reporting
- 2 weeks from reporting
- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.