Appendix B Borehole logs

Caus	sew	ay	Geo	otec	h Ltd	Projec 14-645			Project Name:	Greater D Investigati		lage Sche	me Gro	und		ehol BH10	e No. 06
Method:						Co-or			Client:	Irish Wate						eet 1	
0.00 1.20 1.20 2.30 2.30 7.00	Ro	spection Pil otary Drilling otary Coring	q			30884	2.77mE				•				Scale	: 1:	50
Plant:	R	Jan y CUTINQ	9			23864	7.09mN		Client's Repr	esentative	: Tobin (Consulting	Engine	ers	Crew:	JC	2
Hand Excav	ator+C	comacc	thio 20	5		Groun 49.61N	id Level: MOD		Dates:	24/11/201	4				Logge	ed By	: DOM +MFG
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & D	epth		St	ratum Desc	ription			Lege Wa Stri	ter	Backfil Installs
2.30 - 3.10 3.10 - 4.45 4.45 - 5.50 5.50 - 7.00	100 100 100	73 79 53 77	21 44 0 63	12 7 20 6			(0.30) 49.21 0 (0.60) 48.61 1 (0.40) 48.21 1 (0.90)	2.30 2.00	CONCRETE MADE GROU GRAVEL Firm brown sl coarse. Grav Stiff greyish b Sand is fine to coarse. Weak dark gr as clayey san Medium stron LIMESTONE of weak black veins. Partially weat Discontinuity medium spac stained brown Discontinuity randomly orie curved, typica 2.80-3.10m: E	ightly sandy g el is subangu rown slightly s o coarse. Gra ey LIMESTON dy angular to g thinly to thic interbedded v CARBONAC hered with so Set 1: Beddir ed, planar, sn to 4.3m, clea Set 2: white c ntated, typica ully closed with <i>yrite-rich</i> . <i>xtremely wea</i>	sandy slightly sandy slightly avel is subangular subangular kly laminate vith medium EOUS MUD me oxidation ng/lamination nooth, typical an below. alcite veins, illy subparalle h calcite_infill	ly silty CLAY moded, fine to y gravelly slig gular to subr y highly weat gravel and co d dark grey / to widely spa STONE with staining alo planes, 10 t ly closed to o very close to el to bedding <1-20mm th fault gouge.	Sand is coarse. https://www.andle.coarse. https://www.andle.coarse. hered (re bbbles) wrGILLA(coarse. https://www.andle.coarse. https://wwww.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.coarse. https://www.andle.	fine to CLAY. ine to covered CEOUS thin beds al pyrite urfaces. ry close to illy open, paced,			
Remarks										Core Bar +6 Flush Ty Water Added From (m)	pe:	Water Strike Struck R (m) (n Casing: To (m)	ose to	Time (min) r (mm)	www.cau © Caus	AG sewayg eway G	D S eotech.coo eotech.Ltd

Caus	sew	'ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater Du Investigatio		age Sche	me Grou	und		ole No. I107
Method: 0.00 1.20	In	spection Pi	it			Co-ore		(Client:	Irish Water						t 1 of 1
1.20 2.50 2.50 7.00 Plant:	R	spection Pi otary Drillin otary Corin	9 9				5.92me 5.10mN	C	Client's Rep	presentative:	Tobin (Consulting	Engine	ers	Scale: Crew:	1:50 JC
Hand Excav	ator+C	Comaco	chio 20	5		Groun 54.19N	d Level: /IOD	[Dates:	26/11/2014					Logged I	By: DOM +MFG
Depth (m)	TCR	SCR	RQD	FI	Field Rec	ords	Level & Dep	pth		Stra	itum Desc	ription			Legend Water Strikes	Backfill
							(0.10) 54.09 0.10 (0.60)	0	TOPSOIL Firm brown s fine to coars	slightly sandy sli e. Gravel is sub	ghtly gravel angular to s	lly slightly sil subrounded,	ty CLAY.	Sand is arse.		
							53.49 0.70	70 -	is subangula	own sandy grave ar to subrounded	Ily CLAY w	ith occasion arse. Cobble	al cobbles es are sub	. Gravel angular to		
1.20	SPT (S)				N=33 (2,2/5,9,7	7 ,12)	(0.50) 52.99 1.20 (0.30)	20 -		veak dark grey Ll s angular to suba				athered -		
							52.69 1.5	50 -	Weak to mee	dium strong dark	grey LIME	STONE.				
							(1.00)									
2.50 - 3.40							51.69 2.5	50 -	LIMESTONE		-					
	100	94	0	20					oxidation sta	athered to 3.9m v aining along disc y Set 1: Bedding	ontinuity su	rfaces.	-			
3.40 - 4.70									planar, smoo	oth, typically clos ned orangey bro	ed to open	at close to r				
	100	100	59		1											
4.70 - 6.20				-			(3.70)	_	4 70 6 00m	Accumed acco						
				7				ſ	4.70-0.2011.7	Assumed zone o	<u>or core</u> loss	s.				
	70	70	70						1							
									1							
6.20 - 7.00	0	0	0	NR			47.99 6.20 (0.80)	20 -	No recovery.	 Probably LIME 	STONE.					
					_		47.19 7.00	00 -		E	nd of core at 7	7.00 m				
Pomeric-										Core Barr	el:	Water Strike	es:		<u> </u>	
Remarks										+6 Flush Typ		Struck R	ose to T	'ime min)	▏▁	J
										Water Added:		Casing:			A	<u>f1S</u>
										From (m)	Го (m)	To (m)	Diameter	(mm)	www.causew © Causewa	aygeotech.com y Geotech Ltd

Caus	sew	'ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater Dul Investigatio		age Sch	eme Gro	ound		nole No. 1108
Method: 0.00 1.20	In	anastian Di				Co-ord	ds:		Client:	Irish Water					Shee	et 1 of 1
1.20 2.60 2.60 6.80	R	spection Pi otary Drillin otary Coring	g g				6.52mE 7.91mN		Client's Rep	resentative:	Tobin (Consultin	g Engin	eers	Scale:	1:50
Plant: Hand Excav	/ator+C	Comaco	chio 20	5		Groun	d Level	:	Dates:	02/12/2014					Crew:	JG
						59.37N									Logged Legend	
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level &	Depth	TOPSOIL	Stra	itum Desc	ription			Water Strike	Inetall
1.20	SPT				86 (5,8/86 for 22	20mm)	(<i>0.20</i>) 59.17	0.20	Stiff to very s	tiff dark grey sliq ccasional cobble langular to subre	s and boul	ders. Sand	I is fine to	ntly silty coarse.		コント - ANY IN ANY IN ANY IN ANY IN ANY IN
2.00	(S) SPT (S)				50 (8,18/50 for 2		(2.30)									n na manana ang ang ang ang ang ang ang ang an
2.60 - 3.60	(3)				-		56.87	2.50	fossiliferous /	ng thinly to thick	S LIMESTO	ONE interbe	edded wit	h medium		
	100	64	46	15	-				LIMESTONE	ced very thin be thered with som						
3.60 - 4.60									30°, planar to close to med	Set 1: bedding o curved, smootl ium spaced inte	n, typically rvals, clear	closed to o n.	ccasional	ly open at		
4.60 - 5.60	100	95	92	5						Set 2: joints, wi gh, open, locally			al to 70°,	planar to		
4.00 - 5.00	100	91	66				(4.30)									
5.60 - 6.60				15	-											
6.60 - 6.80	100	82	57	5												
							52.57	6.80		Ē	nd of core at 6	5.80 m				
Remarks	<u> </u>	<u> </u>	<u> </u>		<u> </u>					Core Barro 7 Flush Type			tes: Rose to (m)	Time (min)	A	L GS
										Water Added: From (m)	Го (m)	Casing: To (m)	Diamet	er (mm)	www.causew © Causewa	vaygeotech.com

Caus	sew	'ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater Du Investigatio		nage Scl	heme	Groun	d		iole No 1109	
Method: 2.50 6.20 1.20 2.50	R	otarty Corir	ng			Co-ore	ds:		Client:	Irish Water						Shee	t 1 of 1	
1.20 2.50 0.00 1.20 Plant:	R In	otarty Corir otary Drillin spection Pi	g t				5.62mE 7.79mN		Client's Rep	presentative	Tobin (Consulti	ng En	gineers	3	Scale: Crew:	1:50 JG	
Comacchio	205+H	and Ex	kcavato	r		Groun 71.94N		l:	Dates:	03/12/2014						Logged		
Depth (m)	TCR	SCR	RQD	FI	Field Reco		Level &	Depth		Str	atum Desc	ription				Legend Wate	& Bacl	cfill
							(0.30)		TOPSOIL							Strike	s	
1.20	SPT (S)				N=18 (3,4/5,4,4	,5)	71.64 (2.00)	0.30	occasional o	sh grey slightly s cobbles and bou ubangular fine to	lders. Sand	y gravelly l is fine to	slightly coarse	silty CL e. Grave	AY with l is			
2.00	SPT (S)				55 (4,4/55 for 12	25mm)	69.64	2.30										
2.50 - 3.50				NI	-		(0.35)		angular to s	d dark grey LIME ubangular fine to	o coarse cla	yey grave	el	•				
	97	62	26	7			69.29	2.65	Medium stro ARGILLACE beds of wea	ong thinly lamina EOUS LIMESTO ak black CARBO	ted dark gre NE with me NACEOUS	ey speckle dium to w LIMESTC	ed white /iidely s DNE.	e fossilife paced v	erous ery thin			
				20					Partially we surfaces, ty	athered to 3.5m pically unweathe	with orange red below.	y brown s	staining	on joint				
3.50 - 4.50					-													
	100	100	95															
4.50 - 5.50				7			(3.55)										,°,=	• • •
	100	97	31		-													
5.50 - 6.20	100	56	27	20	-													
				7	-		65.74	6.20		E	ind of core at 6	5.20 m						
Remarks			<u> </u>	<u> </u>						Core Barr	el:	Water Str Struck	rikes: Rose t	o Tim	e			
										7 Flush Typ	e:	(m)	(m)	(mir		A	GS	
										Water Added: From (m)	To (m)	Casing: To (m)	Dia	ameter (m	m)			
																www.causev © Causewa	aygeotech. Iy Geotech	com _td

Cau	sew	/ay	Geo	oter	ch Ltd	Projec 14-645			Project Name:	Greater Dub Investigation		nage Sc	hem	e Gro	und	Bore	hole H11(
Method:						Co-ord	ds:		Client:	Irish Water						Shee		
0.00 1.20 1.20 2.80 2.80 7.50	R	nspection Pi Rotary Drillin Rotary Coring	t ig ig				2.31mE		Client's Repr	resentative:	Tobin (Consulti	ina E	naine	ers	Scale:	1:5	
Plant: Hand Excav	vator+(Comaci	chio 20	15			5.86mN nd Level:									Crew:	JG	DOM
	T	T	T	т	1	76.98N			Dates:	04/12/2014						Logged Legend	і ву: d&	+MFG
Depth (m)	TCR	SCR	RQD	FI	Field Rec	ords	Level & D	Jepth			tum Desc	ription				Wate	er	Backfill Installs
Ĺ.					T		<i>(0.30)</i> 76.68 (0.30	MADE GROU								2000	
0.50	ES						10.00	0.00		grey slightly sa bbles. Sand is ine to coarse.							XIXIX	
									000.00	10 10 000.221							() XII XI	
1.00 1.20	ES SPT				N=17 (3,3/3,4,5	5,5)											त <u>ाः</u> इ.स.	
	(S)						(2.50)										×	
																	<1%1%1>	°."= .°
2.00	SPT (S)				N=25 (5,5/6,6,6	3,7)											dix[x]	
																	XIX:IX	
							74.18 2	2.80	Week dark on	ey LIMESTONE	Probabl	v destruct	tured.	racov	fored as		×#2	
3.20 - 4.20							<i>(0.40)</i> 73.78 3	3.20	clayey angula	ar gravel.		-						
3.20 - 4.20							13.10	3.20		ng thinly laminat . Partially weath								
	100	96	56						Discontinuity	Set 1: Bedding	planes, ext	tremely cl	losely	space	.d,			
									subhorizontal open at close <1mm thick.	to 20°, planar, se to medium spa	smooth, typ cings, unst	pically clo tained to l	ised to	o occas with gre	sionally ey clay			
4.20 - 5.20				1														
	100	100	68														-	
5.20 - 6.20		+		7			(4.30)											
	100	98	54														-	
6.20 - 7.20		┼──	┼──	-														
	100	03	67														-	
	100	83	67															
7.20 - 7.50	100	- 100	- 100	-														
	100	100	100	<u> </u>	-		69.48	7.50		Ē	nd of core at 7	7.50 m					_	
Remarks										Core Barre	el:	Water St	rikes:					
Kelliars												Struck (m)	Rose (m)		Time (min)	_ ∎		
										Flush Type	Ð:					A	G	3
										Water Added: From (m) 1	To (m)	Casing: To (m)	 h	Diamete	(mm)			
											0 (m)	10 (11.)		James	1 (nin)	www.cause © Causew	wayger /ay Ger	otech.com otech Ltd

Cau	sew	'ay	Geo	otec	h Ltd	Projec 14-645		Project Name:	Greater Du Investigatio		nage Scho	eme Gr	ound	Borel	hole H111	
Method:						Co-ore		Client:	Irish Water					Shee		
1.00 5.4 0.00 1.0		Rotary c land du	oring g			31106	5.92mE			Tabia	Concultin	- Fasia		Scale:	1:5	0
Plant:							3.57mN Id Level:	Client's Re	presentative:		Jonsulling	y Engin	eers	Crew:	JC	
Comacchio	205+H	and to	ols			76.63N		Dates:	12/12/2014					Logged	By:	MFG +DOM
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & Depth		Stra	tum Deso	cription			Legeno Wate Strike	r	Backfill Installs
							<i>(0.10)</i> 76.53 0.10	TOPSOIL Firm to stif	f brown slightly sa cobbles and boul	ndy slightly	gravelly sli	ghtly silty	CLAY with		<u> </u>	
							(0.70)		r to subrounded, fi			oarse. G	araver is	2023 2023	と一〇月	
							75.83 0.80 (<i>0.20)</i> 75.63 1.00	Dark grey	LIMESTONE. Hig	hly weathe	red (Driller'	s descrip	tion)		1904	
1.00 - 1.40	88	63	48	6			75.63 1.00	Medium st LIMESTON	rong thinly lamina NE.	ed dark gr	ey ARGILLA	ACEOUS				
1.40 - 1.90								Partially w	eathered to 2.4m v g joint surfaces.	vith some i	ncreased fr	acturing a	and clay			
1 00 0 70	70	0	0	NI				Discontinu	ity Set 1: Bedding	planes, ex	tremely clos	sely spac	ed,			
1.90 - 2.70								open at ve	ntal to 20°, planar, ry close to close s k above 2.4m dep	pacings, u						
	91	90	70	8				Discontinu	ity Set 2: joint, sut	overtical, pl	anar to curv	ved, infille	ed with			
2.70 - 4.00									ning from 4.7m to		V LIMESTO	NE				
				6												
	100	100	93	-			(4.40)									
4.00 - 5.40				-												·
	97	97	56	4												
							71.23 5.40									
							71.23 3.40		E	nd of core at	5.40 m					
Remarks									Core Barr	el:	Water Strik	es:				
												Rose to (m)	Time (min)	_		
									Flush Typ	e:				A	G	S
									Water Added: From (m)	Го (m)	Casing: To (m)	Diamet	ter (mm)	1		_
														www.causev © Causew	waygeo ay Geo	otech.com otech Ltd

Caus	sew	ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater Du Investigatio	blin Drair	nage Sc	heme G	round	Boreho	ole No. 112
Method:						Co-ord			Client:	Irish Water					Sheet	
0.00 7.00	0 R	Rotary [Drilling				2.60mE		Client's Rep			Conculti	na Enai	20070	Scale:	1:50
Plant:							2.28mN					Jonsuiti		licers	Crew:	GT
Beretta T41			·			78.80N			Dates:	03/02/2015					Logged E	
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & D	Jepth		Str	atum Desc	ription			Legend Water Strikes	& Backfill Installs
1.50 1.50	SPT (S) D				N=14 (2,2/3,4,3,	.4)	(2.00)	2.30	cobbles. San fine to coarse	lightly sandy gr d is fine to coar e. y black slightly o coarse. Grav	se. Gravel	is subang	ular to su	brounded		
3.00 3.00	SPT (S) D				N=52 (12,10/14,12,12	:, 14)										
4.50 4.50	SPT (S) D				50 (25 for 40mm 40mm)	n/50 for	(4.70)									
							71.80	7.00			nă of cone at					
Remarks										Core Barr Flush Typ		Water St Struck (m)	rikes: Rose to (m)	Time (min)	A	L SS
										Water Added: From (m)	To (m)	Casing: To (m) 7.00	Diam 200	eter (mm)	www.causewa © Causeway	vgeotech.com Geotech Ltd

Caus	sew	ay i	Geo	otec		Projec 14-645			Project Name:	Greater Du Investigatio	ıblin Drair on	nage Sche	eme Gro	ound	Boreho BH1	
Method:	~ E		illing			Co-ord	ds:		Client:	Irish Water					Sheet	1 of 1
0.00 8.00		Rotary [Junna				8.63mE 4.58mN		Client's Rep	presentative	: Tobin C	Consulting	g Engin	eers		:50 GT
Plant: Beretta T41						Groun	d Level	:	Dates:	03/02/2015	5				Crew: C	
Donth (m)	TCR	SCR	RQD	FI	Field Reco	78.77N	Level &	Donth			atum Desc	rintion			Legend & Water	Backfill
Depth (m)		301	RQD			oras	Leverca	Depui		Str OUND - brown sl		-	ahtly silty	CLAY	Strikes	Installs
1.50 1.50	SPT (S) D				N=12 (2,2/3,2,3,	i,4)	(2.00) 76.77	2.00	Stiff dark gr	ey to black sligh to coarse. Grav	tly sandy sli	ghtly gravell	y slightly	silty CLAY.		
3.00 3.00	SPT (S) D				N=18 (5,4/5,4,4,	.,5)	(2.50)									
4.50 4.50	D SPT (S)				50 (25 for 50mm 60mm)	n/50 for	74.27	4.50	Very stiff da CLAY. Sanc to coarse.	rk grey to black d is fine to coars	slightly sand e. Gravel is	dy slightly gr s subangular	ravelly sli	ghtly silty unded fine		
6.00 6.00	SPT (S) D				50 (25 for 35mm 50mm)	n/50 for	(3.50)									
Remarks							70.77	8.00		Core Barı Flush Tyr		Water Strik Struck F	es: Rose to m)	Time (min)	AC	
										Water Added: From (m)	To (m)	Casing: To (m) 2.00	Diamet 200	er (mm)	www.causeway © Causeway (geotech.com Geotech Ltd

Caus	sew	ay	Geo	otec	h Ltd	Projec 14-645		Project Name:	Greater Du Investigati	ublin Drair on	lage Schei	me Gr	ound		ole No. I114
Method:						Co-orc		Client:	Irish Wate						t 1 of 2
8.50 14.5 0.00 8.50	50 R	otary C otary D	oring				5.60mE	Client's Rep	presentative	: Tobin (Consulting	Engin	eers	Scale:	1:50
Plant: Beretta T41).32mN d Level:				Joneaning				GT
Borotta I II			1			85.66N	10D	Dates:	04/02/201	0				Logged I	
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & Depth			atum Desc	-			Legend Water Strikes	Backfill Installs
1.50	SPT				N=19 (2,2/3,4,5	.7)	<i>(1.50)</i> 84.16 1.50		DUND - Hardcor						
1.50	(S) D							CLAY. Sand to coarse	ng very stiff gre is fine to coars	e. Gravel is	subangular to	subroi	unded fine		
3.00 3.00	SPT (S) D				N=24 (3,4/5,6,7	,6)									
4.50	SPT (S) D				50 (25 for 60mn 50mm)	n/50 for	(7.00)								لى قى
8.50 - 9.50	0	0	0				77.16 8.50 (3.00)	No recovery LIMESTON	Probably disti E.	nctly weathe	ered to destru	ictured			
9.50 - 10.50	0	0	0						с	ontinued on ne	xt sheet				
Remarks		1							Core Bar T210 Flush Tyj Water Added	rel: be:	Water Strike	bse to b) 50	Time (min) 10 ter (mm)	www.causew © Causeway	aygeotech.com y Geotech Ltd

Caus	sew	ay	Geo	otec	h Ltd	Projec 14-645		Project Name:	Greater Du Investigatio		nage Sche	me Gro	ound	Boreho BH1	
Method:						Co-ord	ls:	Client:	Irish Water					Sheet 2	
8.50 14. 0.00 8.5	50 F	lotary C lotary D	rilling				5.60mE 0.32mN	Client's Re	presentative	: Tobin	Consulting	Engine	eers		:50
Plant: Beretta T41						Groun	d Level:	Dates:	04/02/2015						ST
						85.66N								Logged By	
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & Depth		Str	atum Des	cription			Water Strikes	Installs
10.50 - 11.50															
	0	0	0												
11.50 - 12.50				20			74.16 11.50	Medium str	rong grey, white a	and vellow I	arcely recrys	tallised			
				20				LIMESTON sized vugs	IE with very close	ely spaced	coarse sand	to mediu	m gravel		
	100	95	88	1				Distinctly w 11.65m.	veathered: vugs t	hroughout,	clay present	on joints	above		· ·
12.50 - 13.50								DS1: Joints	s, close to mediu	m spaced, s	subhorizonta	to 30°, s	stepped		
				4				DS2: Joints	ar, rough, open, o s, widely spaced,	60-70°, pla	inar to slightl	y irregula	ar, rough,		
	65	60	60				(3.30)	open, patcl at 11.5-11.6	hy yellow staining 65m.	g, 1mm yelle	owish grey cl	ay prese	nt on joint		
13.50 - 14.50								13.1-14.0m	: Assumed zone	of core los	S.				
13.30 - 14.30				NI											
	54	37	14												
				8											
14.50 - 14.80	100	100	100	3			70.86 14.80								
							70.00 14.00		E	nd of core at	14.80 m				
									Core Bar		Water Strike				
Remarks									T210	е.	Struck R (m) (r	ose to n)	Time (min)		
									Flush Typ	be:		50	10	AC	S
									Water Added:		Casing:				
									From (m)	To (m)	To (m)	Diamet	er (mm)	www.causeway © Causeway (geotech.com
1												1		⊌ ⊂auseway (secrech Ltd

Caus	sew	'ay	Geo	oteo	ch Ltd	Projec 14-645		Project Name:	Greater Du Investigatio		age Sche	eme Gro	ound	Boreho BH ²	
Method:						Co-ord	ls:	Client:	Irish Water					Sheet	1 of 1
0.00 3.00 3.00 8.8	0 F	Rotary D Rotary C	orilling				6.67mE 1.51mN	Client's Rep	oresentative	: Tobin C	Consulting	g Engin	eers		1:50
Plant: Beretta T41						Groun	d Level:	Dates:	31/01/2015	5				Crew:	
Donth (m)	TOD	60D	DOD	FI	Field Dec	78.92N								Legend & Water	-
Depth (m)	TCR	SCR	RQD		Field Rec	oras	Level & Depth	TOPSOIL	Str	atum Desc	ription			Strikes	Installs
1.50 1.50	SPT (S) D				N=13 (2,3/2,3,4	4,4)	(0.30) 78.62 0.30 (2.70)	Firm brown fine to coars	slightly sandy sl	ightly gravel angular to su	ly slightly s	ilty CLAY	⁷ . Sand is arse.		
3.00 - 4.00					-		75.92 3.00	Medium stro	ong thinly lamina	ited dark gre	y to black s	slightly			
	0.5							carbonaceo	athered: oxidatio	OUS LIMES	TONE.		r fracture		
	95	70	0					spacing, esp	pecially above 6	.3m.					
4.00 - 5.00								often open a	at very close spa	icing.					****** ***
	90	70	0					brown.	, medium space						
	90	70	0	18					alcite veins, wid ally closed, occa						
5.00 - 6.00															
6.00 - 7.00	90	60	0				(5.80)								
	100	90	22		-										
7.00 - 8.00	100	100	63	10											
8.00 - 8.80	100	100	20				70.12 8.80		,	End of core at 8	90 m				
										.nd oi core at a	.co m				
Remarks	1	1	1	1	1		1	1	Core Barr T2101 Flush Typ				Time (min)	AC	J
									Water Added: From (m)	To (m)	Casing: To (m) 3.00	Diamet 200	er (mm)	www.causeway © Causeway	/geotech.com Geotech Ltd

Caus	sew	ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater Du Investigati		age Sche	me Gro	ound		ole No. 116
Method:	0 5	latar / D	rillin a			Co-ord			Client:	Irish Wate	r				Sheet	1 of 1
0.00 2.00 2.00 9.7	0 R	otary D otary C	oring				3.53mE 0.94mN		Client's Re	oresentative	: Tobin C	Consulting	Engine	eers		1:50
Plant: Beretta T41						Groun	d Level	:	Dates:	02/02/201			-			GT By: DOM +MFG
Depth (m)	TCR	SCR	RQD	FI	Field Reco	75.64N	Level &	Denth		Sti	ratum Desc	rintion			Legend Water	& Backfill
		300	RQD					Deptil	TOPSOIL	50	atum Desc	nption			Strikes	Installs
							(0.30) 75.34 (1.70)	0.30		slightly sandy s se. Gravel is sut						* 0 0 * 0 0 * 0 0 0 0 0
1.50 1.50	SPT (S) D				N=14 (2,2/4,3,4	,3)										
2.00 - 3.00	45	0	0				73.64	2.00	Distinctly we fracture spa	, very closely sp	n oxidised join baced, all ang	nts, weaken	ed, mucł cally 60-ł	n closer		
3.00 - 4.00									and stepped	d, rough, open, l ng, 20-40°, plan	brown oxidat	ion staining.				
	40	0	0	NI					open at ver	y close to close	spacing.					
4.00 - 5.00																
5.00 - 6.00	45	5	0													
6.00 - 7.00	45	25	0	20			(6.80)									
0.00 - 7.00	40	5	0		-											
7.00 - 8.80				NI												
	25	2	0													
8.80 - 9.70				20	-		66.84	8.80	LIMESTON		-	-		· "		
	100	61	49	6			<i>(0.90)</i> 65.94	9.70	closed to of staining.	ng thinly lamina ten open betwe	en 8.8 and 9.	.25m at very	ooth, typ close sj	pacing no		
Remarks										Core Bar T2101 Flush Tyj				Time (min)	A	L GS
										Water Added From (m)	To (m)	Casing: To (m)	Diamet	er (mm)	www.causewa © Causeway	aygeotech.com ' Geotech Ltd

Caus	seway	h Ltd	Projec 14-645			Project Name:	Greate Investi		blin Drain n	age Sche	eme Gro	ound		ole No. I117		
Method: 0.00 6.0	0 Cable P	orouss	ion		Co-ord			Client:	Irish W	/ater					Sheet	t 1 of 1
		ercuss				9.18mE 9.93mN		Client's Re	epresenta	tive:	Tobin C	Consulting	I Engine	ers		1:50
Plant: Dando 3000)				Groun	d Level	:	Dates:	12/01/2	2015					Crew: Logged I	
Donth (m)	Sample / Teat	Casing	Water		72.59N							rintion			Legend Water	&
Depth (m)	Sample / Test	Ueptn (m)	Uepth (m)	Field Reco	oras	Level &	Deptn	TOPSOIL		Stra	itum Desc	ription			Strikes	Inetalle
0.35 - 1.20	В					(0.35) 72.24	0.35	Stiff brown	n slightly san ne to coarse.	dy slig Grav	htly gravell el is subang	y silty CLAY gular to sub	with rare rounded,	e cobbles. fine to		
1.20 1.20 - 1.65	D U					(1.45)										
1.80 - 3.00 2.00 2.00	B SPT(S) D			N=43 (4,6/10,10),11,12)	70.79	1.80	CLAY with	ff dark grey to noccasional o Gravel is su	cobble	s and lense	es of gravell	y sand.	Sand is fine		
3.00 - 3.45	U															
3.50 3.50 - 4.00	D B					(4.20)										
4.00 4.00	SPT(S) D			N=44 (5,7/9,11,1	12,12)	(4.20)										
4.50 - 5.00	В															
5.00 5.00	SPT(S) D			N=41 (6,6/8,10,7	10,13)											
6.00	SPT(S) D			N=38 (4,8/9,9,10	0,10)	66.59	6.00			End	of borehole a					
Remarks SPTs carrier Borehole te	d out using SF rminated at sc	PT ham	nmer C	C04. pletion depth					Chisellin From (m) 0.00	To (m)	Time (hh:mm) 01:00			Time (min)	,	Ţ
				, vopu li					Water A From (m		Го (m)	Casing: To (m) 6.00	Diamete 200	er (mm)	www.causewa © Causewa	aygeotech.com y Geotech Ltd

Caus	Causeway Geotech Lt						ct no. 5		Project Name:	Greater Du Investigatio		inage Sc	heme Gi	round		ole No. 118
Method:						Co-or	ds:		Client:	Irish Water					Shee	t 1 of 2
0.00 8.50 8.50 13.6		able Pe otary D	ercussio Prilling	n			9.73mE		Client's Rei	presentative	Tobin	Consulti	na Enair	eers	Scale:	1:50
Plant: Dando 2000	+Poro	Ha T/1					1.19mN					Consult			Crew:	MMc+GT
			1		1	70.22			Dates:	22/01/2015	5				Logged I	-
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level &	Depth		Str	atum Des	cription			Legend Water Strikes	Dackii
0.00 - 0.50	В						(0.40)		TOPSOIL -	Brown slightly s	andy clay v	vith rootlets	6.			
0.50	D						69.82	0.40		slightly sandy sli						
									sandstone	se. Gravel is sub		angulai in		se oi		
1.00	ODT					5)	(1.00)									
1.20 1.20 - 1.65 1.20 - 1.65	SPT (S) D				N=16 (2,3/4,3,4	,5)	(1.60)									
	B															
2.00	SPT				N=20 (4,5/6,4,5	,5)	68.22	2.00	Stiff, becom	ing very stiff dov	vnhole, dai	rk arev slia	htly sandy	gravelly		
2.00 - 2.45 2.00 - 2.45	(S) D B								slightly silty	CLAY. Sand is f to coarse of sar	ine to coar	se. Gravel	is subrour	ided to		
2.00	0.07					E)										
3.00 3.00 - 3.45 3.00 - 3.45	SPT (S) B				N=20 (5,4/6,4,5	,o)										
	D															
4.00 4.00 - 4.45	SPT (S)				N=22 (6,6/5,5,5	,7)										
4.00 - 4.45	В́ D															
5.00	SPT				N=23 (6,5/6,5,6	,6)										
5.00 - 5.45 5.00 - 5.45	(S) B						(6.50)									
	D															
6.50	SPT				N=31 (7,8/7,8,8	,8)										
6.50 - 6.95 6.50 - 6.95	(S) B															
	D															
8.00	SPT				N=32 (8,7/9,8,8	,7)										
8.00 - 8.45 3.00 - 8.45	(S) D															
	В						61.72	8.50		rk grey slightly s						
									Sand is fine	to coarse. Grav	vel is angu	lar to suba	ngular, tine	e to coarse.		
10.00	SPT (S)				50 (25 for 20mn 30mm)	n/50 for										
	(0)									Core Bar	ontinued on n	ext sheet Water Str	rikos:			2212
Remarks											GI.	Struck (m)	Rose to (m)	Time (min)		
										Flush Typ	e:	11.50	11.50	10		
										Water Added:		Casing:				uð
											To (m)	To (m) 13.60	Diame 150	eter (mm)		
															© Causewa	aygeotech.cor y Geotech Ltd

Mothed: Coorde: Coorde: <t< th=""><th>Caus</th><th colspan="6">Causeway Geotech Ltd</th><th>t no.</th><th>Project Name:</th><th>Greater Du Investigatio</th><th>ublin Drair</th><th>nage Sche</th><th>me Gro</th><th>ound</th><th></th><th>ole No. 118</th></t<>	Caus	Causeway Geotech Ltd						t no.	Project Name:	Greater Du Investigatio	ublin Drair	nage Sche	me Gro	ound		ole No. 118
0.30 0.30	Method:							ds:		_						
Plant: Creating 1/2 Option 2/2000/0 Dates: 22(11/2015 Copyed bit 1/2 Dada 02000-Beertin 1/1 Tot R Rot R P Field Records Kerel 8 Depth Stratum Description Upgend 0	8.50 13.	0 C 60 F	able Pe totary D	ercussio rilling	'n							Consulting	Engine	oore	Scale:	1:50
Production Total Single Production Longent Branch Longent Branch <thlongent branch<="" th=""> Longent Branch<td></td><td>∩+Rere</td><td>+ta T41</td><td>I</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>00110an</td><td>Lug</td><td></td><td></td><td>MMc+GT</td></thlongent>		∩+Rere	+ta T41	I								00110an	Lug			MMc+GT
Income SPT Image: SPT set in the set i			ιια · - · Τ	1					Dates:	22/01/201	5					
11.50 SFT 10.0 DD (25 tor down30 for Bring) S (4) S (4) 13.00 SPT SD (25 tor down30 for Bring) SO (25	Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & Depth		Str	atum Deso	cription	_		Water Strikes	Backfill Installs
Flush Type: Struck (m) (m) (m) 11.50 11.50 Water Added: Casing: From (m) To (m) To (m) To (m) 13.60 150		(S) SPT				0mm) 50 (25 for 30mm				E	īnī of core at 1	13.60 m				
Flush Type: Struck (m) (m) (m) 11.50 11.50 Water Added: Casing: From (m) To (m) To (m) To (m) 13.60 150													96 :			
From (m) To (m) Diameter (mm) 13 60 150	Remarks									Flush Typ	e:	Struck R (m) (I) 11.50 1	ose to n)	(min)	A	L GS
Courseway Costoob /												To (m)		er (mm)	www.causewa	iygeotech.com

0.00 13.00 Rotary Duilling 314889.92mE Calific information Column Transmittive: Tobin Consulting Engineous Galarie: 1.30 Plane: Optime: 241535.37mN Date: 05022015 Column Consulting Engineous Column Consulting Engineous Optime: Sufficience Representative: Tobin Consulting Engineous Column Consulting Engineous 0 TOPSOL-000 Soff Secondrop very stif downfolde signity suredy slightly gravely slightly and slightly gravely slightly slightly gravely slightly gravely s	Caus	sew	ay	Geo	otec	ch Ltd	Projec 14-645			Project Name:	Greater D Investigati	ublin Drair on	nage Sch	eme Gr	ound	Boreho BH1	
Part with transmission withana transmission with transmission with transmission	Method:	00 5	Potary [Drilling						Client:	Irish Wate	r					
Series: University Series: 0.502/2015 Serie: 0.502/2015 Series: 0.502/2015		00 1	totary i	Jinnig						Client's Rep	resentative	: Tobin (Consulting	g Engin	eers		
Total No. Total No. No. P Feed Records Verial & Depth Stratum Description Verial & Depth Depth 130 877 1 1 Feed Records 10001 - Breach CLAF TOPOOL - Breach CLAF Image: Stratum Description Verial & Depth 10001 - Breach CLAF Image: Stratum Description Verial & Depth 10001 - Breach CLAF Image: Stratum Description Image: Stratum Descriptin	Beretta T41						Groun	d Level	:	Dates:	05/02/201	5					
100 101 1																	
150 97 10 N=16 (5,30,5,4,5) 10.20 2.00 150 97 10 N=16 (5,30,5,4,5) 10.20 2.00 130 847 10 N=27 (5,60,7,8,7) 10	Depth (m)	ICR	SCR	RQD	FI	Field Reco	ords	Level &	Depth			ratum Desc	cription			Water Strikes	Installs
300 (S) I N=34 (7,99,8,9,8) 4.50 (S) I S0 (25 for 10mm/60 for 00mm) 0.00 SPT (S) S0 (25 for 10mm/60 for 00mm) (77.00) 7.50 (S) S0 (25 for 10mm/60 for 00mm) (77.00) 0.00 SPT (S) S0 (25 for 10mm/60 for 00mm) (77.00) 7.50 (S) S0 (25 for 10mm/60 for 00mm) (77.00) 0.00 SPT (S) S0 (25 for 70mm/60 for 00mm) (77.00) 0.00 SPT (S) S0 (25 for 70mm/60 for 00mm) (77.00) Remarks Example to the structure on reactant Example to the structure on reactant Fluids Type: Image: 10 mm/10		SPT (S) D				N=18 (4,3/4,5,4			2.00	Stiff becomin silty CLAY. S	ig very stiff dov and is fine to c	vnhole slight oarse. Grave	ily sandy sli el is subanç	ghtly gra gular to si	velly slightly ubrounded		
4.50 SPT (S) SPT (S) 50 (25 for 10mm/50 for 0mm) (11.00) 6.00 SPT (S) 50 (25 for 50mm/50 for 00mm) (11.00) 7.50 SPT (S) 50 (25 for 50mm/50 for 00mm) (11.00) 9.00 SPT (S) 50 (25 for 70mm/50 for 00mm) Image: SPT (S) S0 (25 for 70mm/50 for 00mm) Image: SPT (S) S0 (25 for 70mm/50 for 00mm) 9.00 SPT (S) S0 (25 for 70mm/50 for 00mm) Image: SPT (S) Image: SPT (S) S0 (25 for 70mm/50 for 00mm) Image: SPT (S)	3.00 3.00	SPT (S) D				N=27 (5,6/5,7,8	,7)										
(S) 0mm) (71.00) 7.50 SPT (S) 50 (25 for 50mm/50 for 60mm) 50 (25 for 70mm/50 for 80mm) 9.00 SPT (S) 50 (25 for 70mm/50 for 80mm) 50 (25 for 70mm/50 for 80mm) Continued on next sheet Femarks	4.50 4.50	SPT				N=34 (7,8/9,8,9	,8)										
9.00 SPT (S) 50 (25 for 70mm/50 for 80mm) 50 (25 for 70mm/50 for 80mm) Continued on next sheet Image: Continued on next sheet Flush Type: Image: Provide the strikes Verticer Addedet: Casing: From (m) To (m) Diameter (mm)	6.00	SPT (S)				50 (25 for 10mn 0mm)	n/50 for	(11.00)									
(S) 80mm) Image: Solution of the second	7.50 7.50	SPT (S) D					n/50 for										· · · · · · · · · · · · · · · · · · ·
Remarks Core Barrel: Water Strikes: Flush Type: Image: Compare the strikes: Struck (m) (min) Water Added: Casing: From (m) To (m) Diameter (mm)	9.00					50 (25 for 70mn 80mm)	n/50 for										
Flush Type: Struck (m) Rose to (min) Water Added: Casing: From (m) To (m)													1	(AS'			
Flush Type: Casing: Water Added: Casing: From (m) To (m) Diameter (mm)	Remarks										Core Bar	rei:	Struck	Rose to	Time (min)		
Water Added:Casing:From (m)To (m)To (m)Diameter (mm)											Flush Ty	pe:				Aſ	S
														Diame	ter (mm)		
														2.4116		www.causeway © Causeway	geotech.com Geotech Ltd

Caus	Causeway Geotech Ltd Project no. 14-645								Greater Du Investigatio	blin Drair	nage Sche	me Gr	ound	Boreho BH1	
Method:						Co-ord	ds:	Name: Client:	Irish Water					Sheet 2	
0.00 13.	00 R	Rotary [Drilling				9.92mE	Client's Re	presentative:	Tobin (Consulting	Fnain	eers		:50
Plant: Beretta T41							5.37mN Id Level:								θT
			<u> </u>		T	68.26N	NOD	Dates:	05/02/2015					Logged By	
Depth (m)	TCR	SCR	RQD	FI	Field Rec	ords	Level & Depth	ı	Stra	atum Desc	ription			Legend & Water Strikes	Backfill Installs
Remarks							55.26 13.00		Core Barr	nd of core at 1	Water Strikd Struck R	Rose to	Time		
												tose to m)	Time (min)		a
									Flush Typ	e:				AC	S
									Water Added: From (m)	To (m)	Casing: To (m)	Diame	ter (mm)		
													_	www.causewayg © Causeway G	geotech.com Geotech Ltd

Cau	seway	otec	h Ltd	Projec 14-645			Project Name:	Greate Investi	er Du gatio	blin Drair n	age Scł	neme G	round		iole No. 1120	
Method:					Co-orc			Client:	Irish W	-						t 1 of 2
0.00 11.	.50 Cable F	Percuss	sion			2.58mE		Client's Rep	roconto	tivo:	Tobin (Concultir	na Engi	20072	Scale:	1:50
Plant:	0					1.58mN d Level:		Chefft S Kep				Jonsulli			Crew:	CC
Dando 2000	0			1	65.99N			Dates:	13/01/2	2015						By: DOM
Depth (m)	Sample / Test	Depth		Field Rec	ords	Level & D	epth			Stra	tum Desc	ription			Legend Water	Installs
0.00 - 1.70	В	(m)	(m)					MADE GRO	UND - Firr	n brov	vn grey CL/	AY with gla	ass shard	s.	Strikes	
0.50 1.00 1.20 1.20 1.50	ES D SPT(S) ES			N=10 (2,2/2,3,2	.,3)	(1.70)										
1.70 - 2.00 2.00 2.00 2.00	B D ES SPT(S)			N=39 (4,6/9,9,1	0,11)	64.29 1 (1.40)	1.70	Stiff to very s Sand is fine coarse						ly silty CLAY. I fine to		
3.00 3.00 3.10 - 4.00	D SPT(S) B			N=45 (5,9/11,10	7,10/50 for 225mm)			Very stiff bla coarse. Grav	ck slightly vel is suba	sandy ngulai	gravelly sl to subrour	ghtly silty ided fine t	CLAY. S o coarse.	and is fine to		
4.00 4.00						(2.40)										
5.00 5.00	SPT(S) D			N=35 (4,6/7,8,1	0,10)											
5.50 - 6.50	В					60.49 5	5.50	Stiff black sli to coarse. G	ghtly sand ravel is su	ly sligl bangu	ntly gravelly lar to subro	slightly s ounded fin	ilty CLAY e to coar	. Sand is fine se		
6.50 6.50	D SPT(S)			N=23 (2,3/5,5,6	,7)											
8.00 8.00 8.00 - 9.00	D SPT(S) B			N=19 (3,3/4,5,5	,5)	(5.00)										
9.50 9.50	SPT(S) D			N=29 (3,5/7,7,7	,8)						ntinued en e	rt shoot				
Remarks		1				1			Chisellin		ntinued on ne:	Water Str	ikes:			
SPTs carrie	d out using S t on possible	PT han large b	nmer C oulder	C04. at 11.50m					From (m) 0.00 11.40	To (m) 1.20	Time (hh:mm) 00:30 01:00	Struck (m)	Rose to (m)	Time (min)	A	L GS
									Water A From (m		Го (m)	Casing: To (m) 11.40	Diam 200	eter (mm)	www.causew © Causewa	aygeotech.com y Geotech Ltd

Cau	Projec 14-645			Project Name:	Greate Investig	r Dublii pation	n Draina	age Sch	neme Gi	round		ole No. 1120				
Method:					Co-or			Client:	Irish Wa	-						t 2 of 2
0.00 11.	.50 Cable F	Percuss	sion		31497	2.58mE									Scale:	1:50
Plant:						1.58mN		Client's Re	presentat	tive:	Tobin C	onsultir	ng Engir	neers	Crew:	СС
Dando 200	0				Groun 65.99N	I <mark>d Leve</mark> AOD	1:	Dates:	13/01/2	2015					Logged	By: DOM
Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Reco		Level &	& Depth			Stratu	m Descr	ription			Legend Water Strikes	& Backfil Installs
	_															
10.50 - 11.00	В					55.49	10.50	Stiff black s coarse. Gr	slightly sandy avel is subar	y gravell ngular to	y slightly subround	silty CLA	Y. Sand is o coarse	fine to		
11.00	D					(1.00)										
						54.49	11.50			End of b	orehole at	11.50 m			XXXXX	
Remarks	1	1	1	I		1		1	Chisellin			Water Str		1		I
SPTs carrie	d out using S	PT han	nmer C	C04.					(m)		h:mm)	Struck (m)	Rose to (m)	Time (min)	┤∎	
Refusal me	t on possible	large b	ouldera	at 11.50m					0.00 11.40	11.50 01	:00					201

						AGS
Water A	dded:		Casing:			
From (m)	To (m)	To (m)	Diamete	r (mm)	
			11.40	200		www.causewaygeotech.com
						© Causeway Geotech Ltd

Caus	sew	ay	Geo	oteo	ch Ltd	Projec		Project Name:	Greater Du Investigatio		age Sch	eme Ground			ole No. I121
Method:		-				Co-or		Client:	Irish Water						t 1 of 2
0.00 4.30 4.30 11.9		able Pe lotary D	ercussio)rilling	n			0.35mE					- 5:	s	Scale:	1:50
Plant:							8.11mN	Client's Re	presentative:	Tobin (Consulting	g Engineers	c	Crew:	CC+GT
Dando 2000)+Com	acchio	405			Groun 66.66	id Level: MOD	Dates:	13/01/2015	5				.ogged E	-
Depth (m)	TCR	SCR	RQD	FI	Field Rec	ords	Level & Depth	n	Stra	atum Desc	ription		I	Legend Water Strikes	
0.20 - 1.20	в						<i>(0.20)</i> 66.46 0.20		OUND - Hardcore			with approximate			
0.50	ES							boulders.	JUND - Firm very	/ sandy grav	elly CLAY	with occasional	×		
0.00	20														┌╼
1.00	ES														
1.20 1.20	SPT (S)		1.20		N=10 (2,3/3,3,2	,2)									
1.50	1.20 D						(2.50)								
	ES														, - , -
2.00 2.00	SPT (S)		2.00		N=17 (2,2/6,6,3	,2)									
2.00 2.00 - 2.50	2.00 ES														
2.70	D B						63.96 2.70								
2.70 2.70 - 3.00 3.00	ES B		3.00		50 /7 10/50 fr	00E	00.00 2.70	Very stiff bla fine to coars	ack slightly sandy se. Gravel is sub	/ slightly gra angular to s	velly slight ubrounded	ly silty CLAY. Sat fine to coarse.	nd is		
3.00	3.00 SPT (S)		3.00		50 (7,10/50 for 2	225000)							100 100 100		
3.50 - 4.00	D B														
							(1.80)								
4.00	D		4.00		50 (8,12/50 for	150mm)							212 212 21		
4.00	SPT (S)														
	4.00						62.16 4.50	Very stiff to	hard grey slightly	y sandy slig	htly gravell	y slightly silty CL	AY 🕃		
													에 있네요		
6.00	SPT (S)				50 (25 for 0mm/ 0mm)	/50 for									
							(7.40)						S X		
7.50	SPT				50 (25 for 25mm	n/50 for	(7.40)								
	(S)				35mm)										
													2 2 2 2 2 2 2		
0.00	0.07-				50/05/								<u>*************************************</u>		
9.00	SPT (S)				50 (25 for 45mn 35mm)	n/50 for							N N N N N N N N N N N N N N N N N N N		
													2000		
									Cc	ntinued on nex	kt sheet		<u>,</u>		
Remarks									Core Barr	el:	Water Strik Struck	kes: Rose to Time			
SPTs carrie	d out u	sing Sl	PT ham	imer C	C04.				FI		(m) 2.70	(m) (min) 0.70 20			T
									Flush Typ	e:	10.50	0.70 20		A	GS
									Water Added:		Casing:				
									From (m)	To (m)	To (m) 4.30	Diameter (mm) 200		ww.causewa	aygeotech (
													(ww.causewa © Causeway	y Geotech L

Caus	sew	ay	Geo	otec	h Ltd	Projec 14-645		Project Name:	Greater Du Investigati	ublin Drain on	age Sche	me Gı	round	Borehol BH1	
Method:						Co-ord	ls:	Client:	Irish Wate					Sheet 2	
0.00 4.30 4.30 11.9) C	otary D	ercussio rilling	n			0.35mE 3.11mN	Client's Rep	resentative	: Tobin C	Consulting	Engir	neers		:50
Plant: Dando 2000	+Com	acchio	405			Groun	d Level:	Dates:	13/01/201						C+GT
						66.66N								Logged By Legend & Water	
Depth (m)	TCR	SCR	RQD	FI	Field Reco	ords	Level & Depth		Sti	atum Desc	ription			Water Strikes	Installs
10.50	SPT (S)				50 (25 for 0mm/ 0mm)	50 for	54.76 11.90			End of core at 11					
Remarks SPTs carried	d out u	sing SF	PT ham	imer C	C04.				Core Bar Flush Tyj ^{Water Added} From (m)	De:	Water Strike Struck (m) R 2.70 0. 10.50 0. Casing: To (m) 4.30	ose to n) 70 70	Time (min) 20 20 20	AG	
														www.causewayg © Causeway G	eotech.com eotech Ltd

Cau	seway	otec	h Ltd	Projec 14-645			Project Name:	Greater Investig		ainage Sch	eme Gro	ound	Boreho BH ²		
Method:					Co-ord			Client:	Irish Wa	ater				Sheet	
0.00 10.	.50 Cable P	ercuss	ion		315511	1.95mE								Scale:	1:50
Plant:						6.89mN		Client's Re	presentat	ive: Tobi	n Consultir	g Engin	eers	Crew:	сс
Dando 3000	0				Groun 64.22N	d Level 10D	:	Dates:	07/01/2	015				Logged B	-
Depth (m)	Sample / Test	Casing Depth (m)	Water Depth (m)	Field Reco	ords	Level &	Depth			Stratum D	escription			Legend & Water Strikes	Backfil Installs
0.20 - 1.20 1.20	B SPT(S)			N=16 (3,3/4,3,4	,5)	(<i>0.20</i>) 64.02 (<i>1.50</i>)	0.20	occasional	f brown slight cobbles and 'se. Sand is	boulders. G	velly slightly s ravel is suban um.	ilty CLAY i gular to su	with Ibrounded		
1.20 1.70 - 2.00	В					62.52	1.70	occasional	cobbles and	boulders. G	gravelly sligh ravel is suban s are subangu	gular to su	Ibrounded		
2.50 - 3.00 3.00 3.00	B D SPT(S)			50 (6,7/50 for 22	25mm)										*
4.00 4.00 4.50 - 5.00	D SPT(S) B			50 (4,7/50 for 2'	15mm)										æ
5.00 5.00	SPT(S) D			50 (7,13/50 for 2	200mm)										*
6.00 - 6.50	в					(8.80)									
6.50 6.50 7.00 - 7.50	SPT(S) D B			50 (25 for 125m 150mm)	m/50 for									\$0 <u>5</u> 70 \$0 <u>570</u> \$0 <u>570</u>	
7.50 7.50	SPT(S) D			50 (9,12/50 for 2	225mm)										
9.00 9.00	D SPT(S)			50 (11,14/50 for	150mm)										
9.50 - 10.00	В									Continued o	n next cheat			2019 4019 4019 4019	
Remarks SPT's carrie	ed out using S	PT Ha	nmer (CC04		1		<u> </u>	(m) 0.00	g: To Time (m) (hh:mn 1.20 01:00	Water Stri Struck (m) 3.90	kes: Rose to (m) 2.6	Time (min) 20	A	L GS
									Water Ad From (m)		Casing: To (m) 10.50	Diamet 200	er (mm)	www.causewa © Causeway	ygeotech.com Geotech Ltd

Caus	seway	Geo	otec	ch Ltd	Projec 14-645		Project Name:	Greater D Investigat	Dublin Drain tion	nage Sche	eme Gr	ound	Borehole BH12	
Method:					Co-ord	ds:	Client:	Irish Wate					Sheet 2	
0.00 10.	50 Cable P	ercuss	ion			1.95mE	Client's Repr	resentativ	e: Tobin (Consulting	n Engin	neers	Scale: 1:	
Plant: Dando 3000)				Groun	6.89mN I d Level:	Dates:	07/01/20					Crew: CO	
		Casing	Water	•	64.22N								Logged By: Legend &	
Depth (m)	Sample / Test	Depth (m)	Depth (m)	Field Reco	ords	Level & Depth		S	tratum Desc	ription			Legend & Water Strikes	Backfill Installs
10.40 10.50	SPT(S) D			50 (10,13/50 for	[.] 200mm)	53.72 10.50		F	nd of borehole at	+ 10 50 m				
10.00										10.00				
Remarks								Chiselling:		Water Strike	es:			
	ed out using S	PT Ha	mmer (CC04				From To (m) (m 0.00 1.2	Time (hh:mm) 0 01:00	(m) (i	Rose to (m) 2.6	Time (min) 20		
								0.00	01.00				AG	S
								Water Adde From (m)	d: To (m)	Casing: To (m)	Diamo	eter (mm)		
								From (m)	10 (m)	10 (m)	200	ter (mm)	ł	

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Causeway Geotech Ltd									Project Greater Dublin Drainage Scheme Ground Name: Investigation						Borehole No. BH123		
Method:					Co-ords:			Client: Irish Water						1 of 1			
0.00 4.00 4.00 8.00		able Pe otary D	ercussio)rilling	n		316520.88mE			Clientie Der	Scale:	1:50						
Plant:						241732.26mN Ground Level: 56.88MOD			Chefit's Rep	resentative	resentative: Tobin Consulting Engineers						
Dando 3000	+Bere	141	1	1	1				Dates: 08/12/2014						Logged By: DOM		
Depth (m)	(m) TCR SCR RQD FI Field Re		Field Rec	ords	Level &	Depth		Stratum Description									
0.25 - 1.00	В						(0.25) 56.63 (1.05)	0.25	Firm to stiff o	UND: Grey GR lark brown slig obbles and rar r to subrounde	htly sandy gi e boulders.	ravelly silty C Sand is fine t	LAY with o coarse. Gravel	44-10-44-100-44-100-44-100-44-100-44-100-4			
1.00 1.00 1.30 - 2.00	1.00 SPT (S) D B		1.00		N=15 (3,3/3,4,4	55.58	1.30	Stiff dark brown slightly slightly sandy slightly gravelly slightly silty CLAY with occasional cobbles and rare boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.									
2.00 2.00 2.50 - 3.00	2.00 SPT (S) D B		2.00		N=19 (3,4/4,4,5	,6)	(<i>1.20</i>) 54.38	2.50	Very stiff dark grey to black slightly sandy slightly gravelly slightly silty								
3.00 3.00	3.00 D SPT (S)		3.00		50 (25 for 50mn 75mm)	n/50 for	(1.50)		CLAY with occasional cobbles and rare boulders. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse.								
4.00 4.00	4.00 D SPT (S)		4.00		50 (25 for 65mn 50mm)	n/50 for	52.88	4.00	Dark grey sl to coarse. G	ghtly sandy slig ravel is subang	ghtly gravelly gular to subro	y slightly silty ounded fine to	CLAY. Sand is fine o coarse.				
5.50	SPT (S)				50 (8,30/50 for ⁻	75mm)	(4.00)										
7.00	SPT (S)				50 (25 for 50mn 75mm)	n/50 for											
8.00	SPT (S)				50 (7,28/50 for ⁻	75mm)	48.88	8.00			End of core at	8.00 m					
												1					
Remarks										Core Bar Flush Ty		Water Strike Struck R((m) (n	ose to Time	A	L GS		
										Water Added From (m)	: To (m)	Casing: To (m) 4.00	Diameter (mm)				
														www.causewa © Causeway	ygeotech.cor Geotech Ltd		

Causeway Geotech Ltd							t no.	Project Name:		Greater Dublin Drainage Scheme Ground Investigation				Borehole No. BH124			
Method: Co-ords:								Client:	Irish Water					Sheet 1 of 1			
0.00 4.6 4.60 10.	0 C 00 F	Cable Pe Rotary D	ercussio rilling	n			0.14mE						0.010	Scale: 1:50			
Plant:							2.29mN d Level:	Client's Representative: Tobin Consulting Engine				leers	Crew: (CC+GT			
Dando 2000)+Bere	tta 141				57.53MOD		Dates: 14/01/2015							Logged By: DOM		
Depth (m)	TCR	SCR	RQD	FI	Field Rec	ords	Level & Depth		Str	atum Des	cription			Legend 8 Water Strikes	Backfil Installs		
0.00 - 1.20	В								slightly sandy sl avel is subangul:								
1.20 1.20 1.50 1.50 - 2.00	D SPT (S) 1.20 SPT (S)		1.20		N=11 (2,2/3,2,3 N=14 (2,2/3,3,4		(2.10)										
2.00 2.00 2.10 - 3.00	B SPT (S) D 2.00 B		2.00		N=31 (2,4/7,7,8	3,9)	55.43 2.10	Very stiff gr fine to coars	ey slightly sandy se. Gravel is sub	slightly gra	avelly slight subrounde	ly silty CL d fine to c	AY. Sand is coarse		*		
3.00 3.00 3.50 - 4.00	3.00 SPT (S) D B		3.00	2.9	N=45 (6,9/10,1 ⁻	1,11,13)											
4.00 4.00	D 4.00 SPT (S)		4.00	3.8	50 (9,12/50 for	150mm)											
6.00	SPT (S)				50 (25 for 10mr 10mm)	m/50 for	(7.90)										
7.50 7.50	SPT (S) D				50 (25 for 80mr 100mm)	m/50 for											
9.00 9.00	SPT (S) D				50 (25 for 15mr 25mm)	m/50 for											
							47.53 10.00		E	nd of core at 1	10.00 m						
Remarks	1	1	1	1	I		1	1	Core Bar	rel:	Water Str Struck	kes: Rose to	Time				
SPTs carrie	d out u	sing SI	PT ham	nmer C	C04.				Flush Typ	be:	(m) 2.90	(m) 2.60	(min) 20				
											Coolerna			AU	5		
									Water Added: From (m)	To (m)	Casing: To (m) 4.60	Diame 200	eter (mm)	_			
														www.causeway © Causeway	/geotech.com Geotech Ltd		