

# NOTICE TO MARINERS

**Issue Date: 1<sup>st</sup> July, 2016**

**Western Link Project**

## **Deep water cable installation in the North Channel**

Mariners are advised that the third deep water installation campaign of the Western Link HVDC cable, in the North Channel of the Irish Sea between Scotland and Northern Ireland for about 120km, is planned to commence at the beginning of July 2016 and target completion in September 2016.

The laying operations work is being carried out by **Prysmian** using **Giulio Verne** (IMO 8302014; Call Sign IBPU) cable lay vessel and the burial works is being completed with a plough by **Deep Ocean 1 UK** using **Go Pegasus** (IMO 9495210, Call Sign V7CE4) support vessel following the cable laying vessel at a short distance.

**During such times the vessels will have restricted ability to manoeuvre and other vessels are requested to pass at a safe speed and distance.**

**The vessels will monitor VHF Channel 16 at all times.**



*Cable Laying vessel - Giulio Verne*



**Plough Support vessel - Go Pegasus**

## Project Description

The Western Link Project consists of installing two 600 kV DC submarine cables in the Irish Sea from Ardnail (Scotland) to Wirral (England) for a total route length of about 387 km (Figure 3). The cables will usually be laid as two separate cables approximately 30 metres apart. The third campaign of about 120km is being installed from south to north, more specifically from KP177 in Northern Irish Waters to KP58 in Scottish waters (highlighted in Red in Figure 3) with the following sequence of operations.

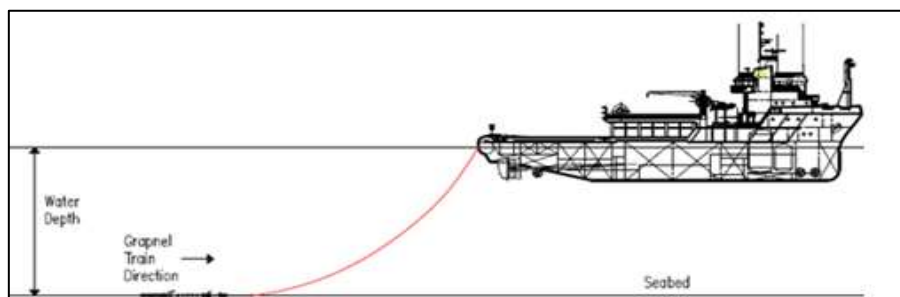
## Pre- Lay Survey

The cable burial vessel Go Pegasus performed a Pre-Lay survey along the installation route of the third campaign using an ROV as communicated in previous NTM. The previously installed pre-lay mattresses layout were re-surveyed and confirmed their positions above the existing cable and pipeline crossings (where applicable).

## PLGR (Pre Lay Grapnel Run)

Go Pegasus also executed a PLGR operation, along the planned installation route in advance of the cable installation operations. The PLGR used a series of grapnel hooks which were towed along the proposed route to clear any seabed debris or obstructions prior to the cable being laid. Figure 1 illustrates a typical PLGR arrangement.

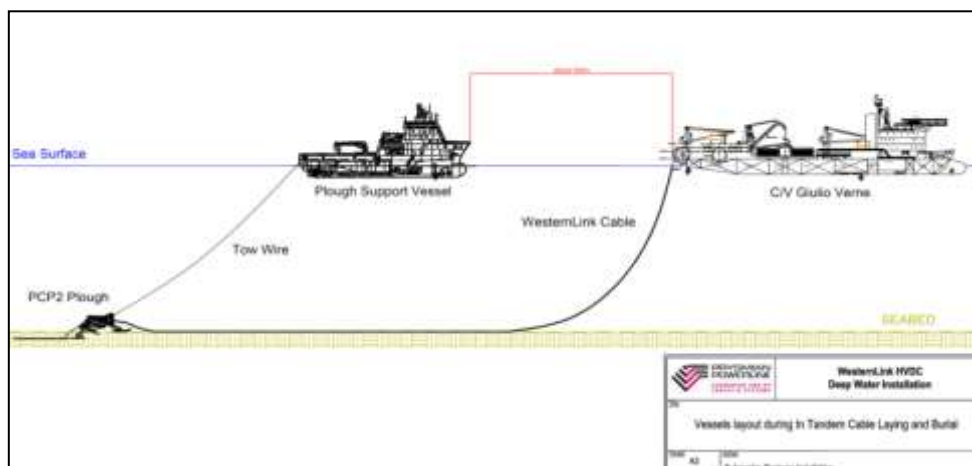
During the PLGR operation sonar markers have been installed at crossings where required as homing for the burial spread while approaching the crossing location.



**Figure 1 – Typical PLGR arrangement**

## Cable Laying & Burial

In this campaign the Western Link HVDC cable is installed by using a laying and burial “in tandem” technique, in which the Cable Laying vessel Giulio Verne will surface lay the cable on the seabed, while a plough towed by its support vessel Go Pegasus will bury them at a short distance behind (approximately 500m), see Figure 2. Where cable burial is not possible (due to service crossings and / or where seabed conditions are unfavourable), guard vessels will be stationed to monitor the cable and provide advice to mariners.



**Figure 2** – Laying and Burial “In Tandem” arrangement

Two sections of this campaign, from KP 177 to KP 160 and from KP 70 to KP 58, will be free laid and buried by post lay jetting at the end of the parallel campaign. While awaiting the post lay burial by jetting operations, Guard vessels will remain in place to monitor the exposed cable.

The sonar markers pre-installed at the crossings will be removed when leaving the relevant service crossing.

The coordinates of planned start and end points of Campaign 3, and the expected locations of the surface laid cables are listed in the table below. Final “as laid” coordinates will be issued after the completion of Campaign 3.

ID (Position Name / Event)	KP (km from Ardsneil Bay)	WGS 84	
		Latitude	Longitude
End of Campaign 3 End of surface laid cable	58	55° 15.907'N	005° 12.012'W
Start of surface laid cable	70	55° 11.670'N	005° 19.370'W
End of surface laid cable	160	54° 29.578'N	005° 12.399'W
Start of Campaign 3 Start of surface laid cable	177	54° 21.352'N	005° 14.279'W

**Table 1** – Third Campaign start and finish points and surface laid cable locations.

## Service crossing

As part of the third campaign the Western Link HVDC cable crosses eleven existing services.

Plough operations will be stopped at a distance agreed in the crossing agreements with the asset owners and in these locations the cable will be free laid over the crossing and protected using post protection methods (concrete mattresses or rock placement) at the end of the parallel campaign. While awaiting the post lay protection operation, Guard vessels will remain in place to monitor the exposed cable.

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	KP (km) from Ardneil [North]	Number of mattresses installed
	Easting	Northing	Latitude	Longitude			
Lanis_3_(2)_Cable_IS	359041	6126106	55° 15.675'N	005° 13.092'W	47	59,632	N/A (Urduct)
Hibernia_A_Cable_IS	337025	6094832	54° 58.422'N	005° 32.782'W	145	99,203	N/A (Urduct)
Scotland_Northern-Ireland_2_Cable_IS	336812	6090485	54° 56.077'N	005° 32.833'W	149	103,776	5
MOYLE_Interconnector_North_Cable_IS	337087	6089912	54° 55.774'N	005° 32.556'W	151	104,414	3
MOYLE_Interconnector_Return_North_Cable_IS	337099	6089889	54° 55.761'N	005° 32.544'W	151	104,440	N/A (Urduct)
Scotland_to_Northern_Ireland_(SNIP)_Pipeline_IS	337916	6088276	54° 54.908'N	005° 31.725'W	148	106,251	3
MOYLE_Interconnector_South_Cable_IS	338072	6087972	54° 54.747'N	005° 31.569'W	148	106,594	N/A (Urduct)
MOYLE_Interconnector_Return_South_Cable_IS	338083	6087949	54° 54.736'N	005° 31.558'W	148	106,619	N/A (Urduct)
Lanis_3_(3)_Cable_IS	338970	6086196	54° 53.809'N	005° 30.669'W	140	108,593	1
Scotland-Northern_Ireland_1_Cable_IS	351049	6062744	54° 41.398'N	005° 18.656'W	157	136,478	5
Lanis_2_Cable_IS	355763	6035523	54° 26.813'N	005° 13.470'W	122	165,993	N/A (Urduct)

**Table 2 – Second Campaign Crossings**

**Vessels are requested to pass at a safe speed and distance and fishing vessels are advised to remain a safe distance (approximately 1.5 nautical miles) from the free laid sections and the crossing sections. Deployed Guard Vessels will monitor the exposed areas and advise of safe distances locally.**

## Post Lay Survey

At the completion of the campaign a Post-lay survey will be carried out along the cable route using the Go Pegasus vessel. The survey will consist of a visual and instrumental ROV survey of the installed Western Link cable.



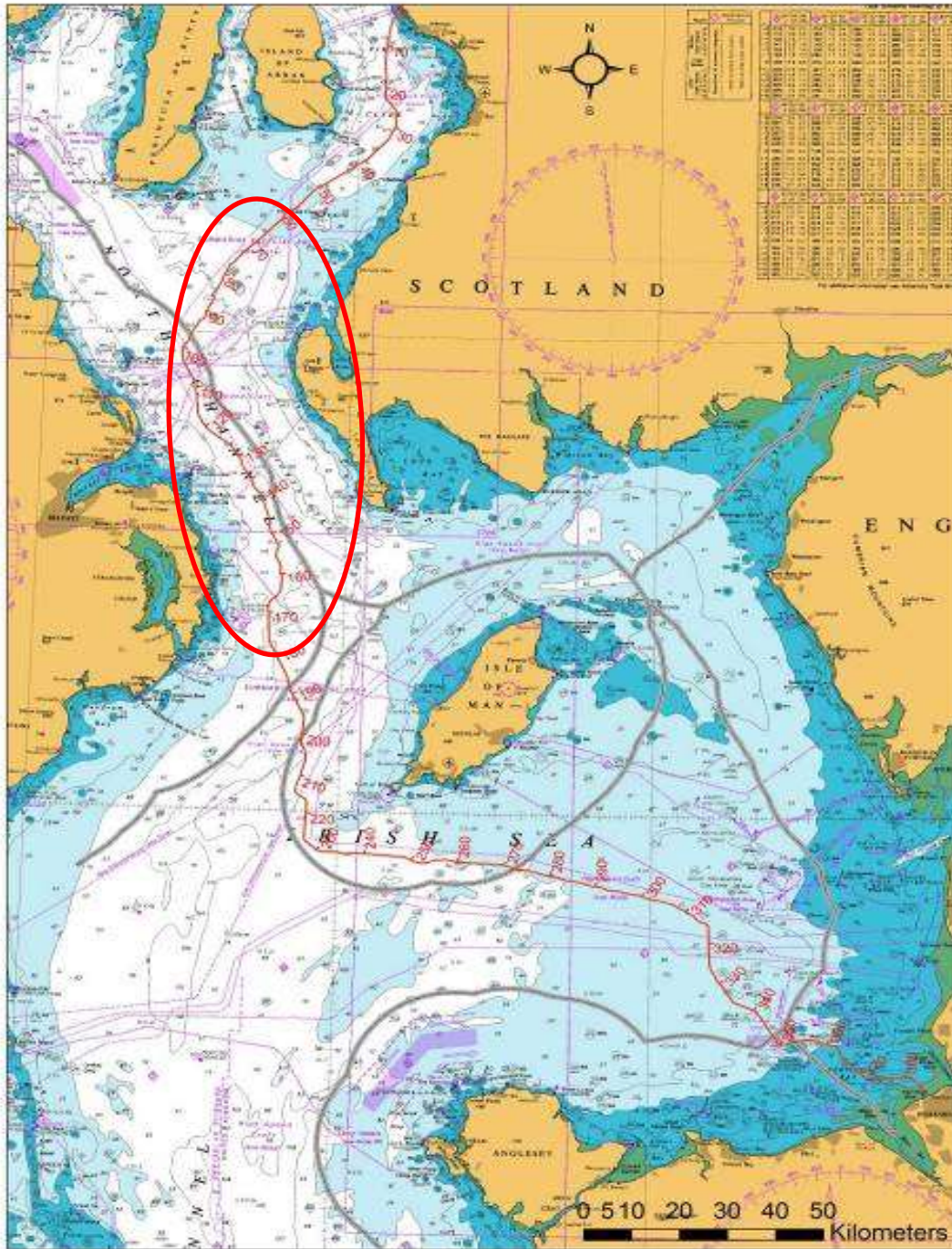


Figure 3 – Western Link cable route and highlighted third Deep Water installation section (in Red)

## APPENDIX 1

**Table 3 – Third Campaign installation section route. Shaded cells in the table indicate lengths of cable that will be free laid and subsequently buried by jetting.**

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_39	360198	6126500	55° 15.907'N	005° 12.012'W	47	5,460	58,409	328,752	220,4	18,0
AC_40	359783	6126262	55° 15.772'N	005° 12.396'W	47	0,478	58,887	328,273	238,4	16,8
LANIS_3_(2)_Cable_IS	359042	6126091	55° 15.667'N	005° 13.090'W	47	0,760	59,647	327,513	255,2	0,0
AC_41	358744	6126022	55° 15.625'N	005° 13.370'W	47	0,307	59,954	327,206	255,2	15,9
AC_42	358459	6125865	55° 15.535'N	005° 13.634'W	47	0,325	60,279	326,881	239,3	13,8
AC_43	358220	6125645	55° 15.412'N	005° 13.852'W	47	0,325	60,604	326,556	225,4	15,9
AC_44	357243	6124042	55° 14.532'N	005° 14.726'W	47	1,878	62,482	324,678	209,5	13,3
AC_45	352146	6118898	55° 11.670'N	005° 19.370'W	56	7,243	69,725	317,436	222,9	2,9
AC_46	349623	6116607	55° 10.391'N	005° 21.673'W	61	3,408	73,133	314,028	225,8	5,8
AC_47	347137	6113842	55° 08.856'N	005° 23.923'W	75	3,718	76,851	310,309	220,0	8,7
AC_48	346547	6113358	55° 08.584'N	005° 24.463'W	73	0,763	77,615	309,546	228,7	7,6
AC_49	346278	6113071	55° 08.424'N	005° 24.706'W	75	0,394	78,009	309,152	221,1	19,1
AC_50	345570	6111481	55° 07.555'N	005° 25.319'W	80	1,740	79,748	307,412	202,0	10,4
AC_51	345181	6110912	55° 07.241'N	005° 25.666'W	82	0,689	80,438	306,723	212,4	20,2
AC_52	345081	6110513	55° 07.024'N	005° 25.748'W	83	0,411	80,849	306,311	192,1	13,0
AC_53	344880	6110120	55° 06.808'N	005° 25.924'W	85	0,442	81,291	305,870	205,1	15,8
AC_54	344808	6109760	55° 06.613'N	005° 25.980'W	84	0,368	81,659	305,502	189,3	12,8
AC_55	344539	6109158	55° 06.284'N	005° 26.213'W	87	0,659	82,317	304,843	202,1	1,4
AC_56	344279	6108615	55° 05.986'N	005° 26.439'W	93	0,602	82,920	304,241	203,5	4,7

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_57	344113	6108329	55° 05.829'N	005° 26.586'W	95	0,331	83,251	303,910	208,2	10,0
AC_58	343994	6108005	55° 05.652'N	005° 26.687'W	95	0,345	83,596	303,564	198,2	4,0
AC_59	343870	6107730	55° 05.502'N	005° 26.794'W	99	0,301	83,897	303,263	202,2	19,6
AC_60	343711	6107565	55° 05.410'N	005° 26.938'W	100	0,230	84,127	303,034	221,9	3,0
AC_61	343453	6107322	55° 05.274'N	005° 27.173'W	103	0,354	84,481	302,680	224,9	7,8
AC_62	342927	6106675	55° 04.916'N	005° 27.645'W	100	0,834	85,314	301,846	217,1	19,4
AC_63	342859	6106486	55° 04.812'N	005° 27.702'W	103	0,202	85,516	301,644	197,7	17,3
AC_64	342847	6106192	55° 04.654'N	005° 27.705'W	106	0,294	85,810	301,351	180,4	10,8
AC_65	342878	6105981	55° 04.541'N	005° 27.668'W	104	0,213	86,023	301,138	169,6	20,0
AC_66	343026	6105707	55° 04.396'N	005° 27.520'W	98	0,312	86,335	300,826	149,6	18,7
AC_67	343063	6105485	55° 04.277'N	005° 27.478'W	98	0,225	86,560	300,600	168,4	18,6
AC_68	343025	6105242	55° 04.146'N	005° 27.506'W	103	0,245	86,806	300,355	187,0	10,1
AC_69	342945	6105013	55° 04.021'N	005° 27.573'W	104	0,243	87,049	300,112	197,1	7,6
AC_70	342827	6104778	55° 03.892'N	005° 27.676'W	105	0,262	87,311	299,849	204,7	9,4
AC_71	342451	6104264	55° 03.608'N	005° 28.012'W	107	0,638	87,949	299,212	214,2	11,7
AC_72	342333	6104004	55° 03.466'N	005° 28.114'W	107	0,286	88,234	298,926	202,5	2,7
AC_73	342177	6103700	55° 03.299'N	005° 28.251'W	111	0,342	88,576	298,585	205,2	10,1
AC_74	342054	6103539	55° 03.210'N	005° 28.361'W	110	0,202	88,778	298,382	215,3	9,3
AC_75	341870	6103365	55° 03.113'N	005° 28.528'W	107	0,253	89,032	298,129	224,6	18,8
AC_76	341776	6103187	55° 03.015'N	005° 28.610'W	106	0,201	89,233	297,928	205,8	12,3
AC_77	341699	6102911	55° 02.865'N	005° 28.673'W	109	0,287	89,519	297,641	193,6	6,1
AC_78	341623	6102722	55° 02.761'N	005° 28.737'W	112	0,204	89,723	297,437	199,7	6,7
AC_79	341524	6102539	55° 02.661'N	005° 28.824'W	113	0,208	89,932	297,229	206,4	11,2
AC_80	341428	6102228	55° 02.492'N	005° 28.904'W	121	0,325	90,257	296,904	195,2	7,6
AC_81	341332	6102021	55° 02.378'N	005° 28.987'W	130	0,228	90,485	296,675	202,8	20,4

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	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_82	341314	6101783	55° 02.250'N	005° 28.997'W	130	0,239	90,724	296,437	182,4	8,1
AC_83	341333	6101477	55° 02.085'N	005° 28.968'W	130	0,307	91,031	296,130	174,4	11,8
AC_84	341304	6101274	55° 01.976'N	005° 28.989'W	129	0,204	91,235	295,925	186,1	11,8
AC_85	341228	6101063	55° 01.861'N	005° 29.053'W	124	0,224	91,459	295,701	197,9	5,8
AC_86	341140	6100881	55° 01.761'N	005° 29.130'W	133	0,203	91,662	295,499	203,6	19,4
AC_87	340997	6100739	55° 01.681'N	005° 29.258'W	131	0,201	91,863	295,297	223,1	19,6
AC_88	340812	6100652	55° 01.631'N	005° 29.429'W	131	0,204	92,068	295,093	242,7	6,8
AC_89	340492	6100545	55° 01.567'N	005° 29.726'W	128	0,338	92,405	294,755	249,5	18,6
AC_90	340208	6100331	55° 01.446'N	005° 29.985'W	122	0,356	92,762	294,399	231,0	19,8
AC_91	339780	6099677	55° 01.086'N	005° 30.364'W	129	0,781	93,543	293,618	211,1	4,4
AC_92	339596	6099342	55° 00.902'N	005° 30.526'W	129	0,382	93,925	293,235	206,8	10,9
AC_93	339435	6099149	55° 00.795'N	005° 30.670'W	132	0,251	94,176	292,985	217,7	4,5
AC_94	339242	6098875	55° 00.644'N	005° 30.842'W	133	0,335	94,511	292,649	213,2	6,3
AC_95	339110	6098636	55° 00.512'N	005° 30.958'W	130	0,274	94,785	292,376	206,9	2,3
AC_96	338970	6098358	55° 00.360'N	005° 31.079'W	130	0,311	95,096	292,065	204,5	1,1
AC_97	338804	6098008	55° 00.168'N	005° 31.223'W	129	0,387	95,483	291,677	203,5	10,8
AC_98	338532	6097639	54° 59.964'N	005° 31.465'W	129	0,458	95,941	291,219	214,2	16,5
AC_99	338448	6097405	54° 59.836'N	005° 31.536'W	131	0,249	96,191	290,970	197,8	1,8
AC_100	338379	6097193	54° 59.721'N	005° 31.594'W	131	0,223	96,413	290,747	196,0	5,0
Scotland/Northern Ireland waters	338209	6096796	54° 59.503'N	005° 31.739'W	137	0,432	96,845	290,315	201,0	0,0
AC_101	338082	6096496	54° 59.339'N	005° 31.848'W	140	0,326	97,171	289,990	201,0	3,0
AC_102	337904	6096009	54° 59.074'N	005° 31.998'W	139	0,518	97,689	289,471	198,0	6,4
AC_103	337808	6095815	54° 58.967'N	005° 32.082'W	140	0,216	97,905	289,255	204,4	6,3
AC_104	337686	6095483	54° 58.786'N	005° 32.184'W	143	0,354	98,260	288,901	198,0	12,2
AC_105	337557	6095278	54° 58.673'N	005° 32.298'W	142	0,242	98,501	288,659	210,2	18,9



ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_106	337372	6095129	54° 58.589'N	005° 32.467'W	144	0,238	98,739	288,421	229,1	3,7
Hibernia_A_Cable_IS	337031	6094818	54° 58.415'N	005° 32.775'W	145	0,462	99,201	287,960	225,5	0,0
AC_107	336843	6094646	54° 58.319'N	005° 32.945'W	143	0,255	99,456	287,705	225,4	18,2
AC_108	336566	6094152	54° 58.047'N	005° 33.188'W	141	0,566	100,022	287,139	207,3	19,6
AC_109	336443	6093445	54° 57.664'N	005° 33.279'W	149	0,718	100,740	286,421	187,7	12,2
AC_110	336454	6093188	54° 57.526'N	005° 33.260'W	148	0,257	100,997	286,163	175,5	0,2
AC_111	336497	6092234	54° 57.012'N	005° 33.187'W	148	0,955	101,953	285,208	175,3	0,8
AC_112	336510	6091831	54° 56.796'N	005° 33.162'W	149	0,402	102,355	284,806	176,1	5,9
AC_113	336546	6091563	54° 56.652'N	005° 33.118'W	150	0,271	102,626	284,535	170,2	3,1
AC_114	336563	6091357	54° 56.542'N	005° 33.096'W	149	0,206	102,832	284,328	173,3	1,2
AC_115	336599	6091006	54° 56.353'N	005° 33.050'W	149	0,353	103,185	283,976	172,1	17,0
AC_116	336679	6090815	54° 56.252'N	005° 32.968'W	149	0,207	103,392	283,768	155,1	4,8
AC_117	336741	6090623	54° 56.150'N	005° 32.904'W	149	0,202	103,594	283,566	159,9	14,6
Scotland_North-Ireland_2_Cable_IS	336823	6090496	54° 56.083'N	005° 32.823'W	149	0,151	103,746	283,415	145,3	0,0
AC_118	336927	6090333	54° 55.997'N	005° 32.720'W	149	0,194	103,939	283,221	145,3	16,1
AC_119	336985	6090140	54° 55.894'N	005° 32.659'W	150	0,202	104,141	283,020	161,4	11,2
MOYLE_Interconnector_North_Cable_IS	337099	6089922	54° 55.779'N	005° 32.545'W	151	0,246	104,387	282,774	150,2	0,0
AC_120	337306	6089529	54° 55.571'N	005° 32.338'W	150	0,444	104,831	282,330	150,2	5,6
AC_121	337435	6089212	54° 55.403'N	005° 32.207'W	150	0,341	105,172	281,988	155,8	7,3
AC_122	337709	6088726	54° 55.147'N	005° 31.934'W	149	0,558	105,731	281,430	148,5	3,7
AC_123	337809	6088519	54° 55.037'N	005° 31.834'W	148	0,230	105,961	281,200	152,2	1,4
Scotland_to_Northern_Ireland_(SNIP)_Pipeline_IS	337929	6088285	54° 54.913'N	005° 31.714'W	148	0,263	106,224	280,937	150,8	0,0
MOYLE_Interconnector_South_Cable_IS	338085	6087979	54° 54.752'N	005° 31.557'W	148	0,344	106,568	280,593	150,8	0,0

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_124	338168	6087818	54° 54.666'N	005° 31.474'W	147	0,181	106,749	280,412	150,8	5,5
AC_125	338277	6087544	54° 54.521'N	005° 31.363'W	145	0,294	107,043	280,117	156,3	7,4
AC_126	338493	6087154	54° 54.315'N	005° 31.148'W	140	0,446	107,489	279,672	148,9	3,3
AC_127	338604	6086925	54° 54.194'N	005° 31.037'W	137	0,255	107,744	279,417	152,2	3,0
AC_128	338840	6086362	54° 53.895'N	005° 30.797'W	141	0,611	108,354	278,806	155,2	18,7
LANIS_3_(3)_Cable_IS	338976	6086206	54° 53.814'N	005° 30.664'W	139	0,207	108,562	278,599	136,6	0,0
AC_129	339125	6086038	54° 53.726'N	005° 30.520'W	139	0,225	108,786	278,374	136,6	5,4
AC_130	339321	6085853	54° 53.631'N	005° 30.330'W	136	0,269	109,055	278,105	131,2	20,4
AC_131	339413	6085668	54° 53.533'N	005° 30.238'W	135	0,207	109,262	277,898	151,6	20,0
AC_132	339436	6085467	54° 53.424'N	005° 30.210'W	135	0,203	109,465	277,696	171,6	14,9
AC_133	339385	6085126	54° 53.240'N	005° 30.247'W	133	0,344	109,809	277,351	186,5	4,6
AC_134	339274	6084651	54° 52.982'N	005° 30.334'W	138	0,488	110,297	276,864	191,1	19,1
AC_135	339313	6084276	54° 52.781'N	005° 30.285'W	138	0,377	110,674	276,486	171,9	2,4
AC_136	339331	6083992	54° 52.628'N	005° 30.259'W	135	0,285	110,959	276,201	174,4	3,3
AC_137	339332	6083683	54° 52.462'N	005° 30.247'W	134	0,309	111,268	275,893	177,7	3,9
AC_138	339354	6083379	54° 52.298'N	005° 30.217'W	136	0,305	111,573	275,587	173,9	20,5
AC_139	339439	6083192	54° 52.199'N	005° 30.131'W	137	0,205	111,778	275,382	153,4	6,3
AC_140	339502	6083000	54° 52.097'N	005° 30.065'W	137	0,202	111,980	275,181	159,7	19,7
AC_141	339497	6082793	54° 51.985'N	005° 30.064'W	137	0,208	112,188	274,973	179,4	1,7
AC_142	339498	6082556	54° 51.858'N	005° 30.055'W	136	0,237	112,425	274,736	177,7	16,6
AC_143	339441	6082362	54° 51.752'N	005° 30.101'W	136	0,203	112,627	274,533	194,3	17,6
Cable Unknown_(1)	339442	6082323	54° 51.731'N	005° 30.099'W	137	0,039	112,666	274,494	176,7	0,0
Cable Unknown_(2)	339446	6082145	54° 51.635'N	005° 30.090'W	137	0,178	112,844	274,316	176,7	0,0
AC_144	339447	6082076	54° 51.598'N	005° 30.086'W	136	0,069	112,913	274,247	176,7	3,6
AC_145	339469	6081810	54° 51.456'N	005° 30.057'W	135	0,266	113,179	273,981	173,2	3,3

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_146	339475	6081594	54° 51.339'N	005° 30.044'W	133	0,216	113,396	273,765	176,4	7,1
AC_147	339520	6081296	54° 51.179'N	005° 29.992'W	135	0,302	113,698	273,463	169,4	3,7
AC_148	339554	6080897	54° 50.965'N	005° 29.947'W	136	0,400	114,098	273,063	173,1	11,7
AC_149	339622	6080671	54° 50.845'N	005° 29.877'W	135	0,236	114,333	272,827	161,4	6,3
AC_150	339667	6080420	54° 50.710'N	005° 29.826'W	135	0,256	114,589	272,571	167,7	19,4
AC_151	339608	6080056	54° 50.513'N	005° 29.868'W	135	0,369	114,958	272,203	187,1	15,2
AC_152	339651	6079649	54° 50.295'N	005° 29.815'W	135	0,409	115,367	271,793	171,9	9,1
AC_153	339722	6079389	54° 50.156'N	005° 29.740'W	135	0,269	115,636	271,524	162,8	14,8
AC_154	339724	6078905	54° 49.895'N	005° 29.722'W	135	0,484	116,121	271,040	177,7	4,2
AC_155	339766	6078379	54° 49.613'N	005° 29.666'W	135	0,527	116,648	270,512	173,5	17,5
AC_156	339930	6077973	54° 49.397'N	005° 29.499'W	133	0,438	117,086	270,074	155,9	1,1
AC_157	340004	6077778	54° 49.293'N	005° 29.423'W	133	0,209	117,295	269,866	157,1	16,0
AC_158	340124	6077618	54° 49.210'N	005° 29.306'W	135	0,200	117,495	269,666	141,0	14,5
AC_159	340242	6077334	54° 49.059'N	005° 29.187'W	135	0,307	117,802	269,359	155,5	6,1
AC_160	340422	6077003	54° 48.884'N	005° 29.008'W	130	0,377	118,179	268,981	149,4	16,0
AC_161	340493	6076687	54° 48.715'N	005° 28.932'W	127	0,323	118,503	268,658	165,4	9,5
AC_162	340586	6076457	54° 48.593'N	005° 28.837'W	124	0,249	118,751	268,410	155,9	12,1
AC_163	340877	6076027	54° 48.367'N	005° 28.551'W	121	0,520	119,271	267,890	143,8	2,5
Knock_Bay- Whitehead_Telegraph_Ca ble_OOS	340929	6075958	54° 48.331'N	005° 28.501'W	121	0,086	119,356	267,804	141,3	0,0
AC_164	341217	6075571	54° 48.128'N	005° 28.219'W	121	0,483	119,839	267,321	141,3	10,7
AC_165	341496	6075314	54° 47.995'N	005° 27.950'W	122	0,380	120,219	266,942	130,6	13,8
AC_166	341611	6075141	54° 47.903'N	005° 27.837'W	123	0,208	120,427	266,734	144,4	4,0
AC_167	341804	6074890	54° 47.772'N	005° 27.650'W	129	0,316	120,743	266,418	140,4	11,7
AC_168	342477	6074311	54° 47.473'N	005° 27.003'W	130	0,888	121,631	265,530	128,7	1,1

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_169	342818	6074006	54° 47.315'N	005° 26.676'W	129	0,457	122,088	265,073	129,8	4,8
AC_170	343374	6073586	54° 47.099'N	005° 26.144'W	130	0,697	122,785	264,376	125,1	4,8
AC_171	343741	6073355	54° 46.981'N	005° 25.794'W	130	0,434	123,219	263,942	120,3	6,9
Port_Kale-Whitehead_Telegraph_Cable_OOS	343954	6073181	54° 46.892'N	005° 25.590'W	135	0,275	123,494	263,666	127,1	0,0
AC_172	344071	6073086	54° 46.843'N	005° 25.478'W	136	0,150	123,644	263,516	127,1	1,3
AC_173	344399	6072806	54° 46.698'N	005° 25.163'W	139	0,432	124,076	263,084	128,5	1,0
AC_174	344560	6072664	54° 46.625'N	005° 25.009'W	139	0,214	124,290	262,870	129,5	7,2
AC_175	344827	6072483	54° 46.532'N	005° 24.754'W	140	0,323	124,613	262,547	122,2	8,0
AC_176	344978	6072346	54° 46.461'N	005° 24.609'W	143	0,204	124,817	262,344	130,2	11,2
AC_177	345218	6072202	54° 46.388'N	005° 24.380'W	144	0,280	125,097	262,063	119,0	5,9
AC_178	345380	6072080	54° 46.325'N	005° 24.225'W	145	0,203	125,300	261,860	124,9	3,3
AC_179	345551	6071936	54° 46.251'N	005° 24.062'W	146	0,223	125,523	261,638	128,2	4,8
AC_180	345707	6071781	54° 46.170'N	005° 23.912'W	145	0,220	125,743	261,417	133,0	4,1
AC_181	345881	6071629	54° 46.092'N	005° 23.744'W	149	0,231	125,974	261,186	128,9	3,8
AC_182	346325	6071294	54° 45.919'N	005° 23.320'W	150	0,556	126,531	260,630	125,2	1,5
AC_183	346526	6071149	54° 45.845'N	005° 23.128'W	148	0,248	126,779	260,382	123,7	13,5
AC_184	346683	6070968	54° 45.750'N	005° 22.976'W	148	0,240	127,019	260,142	137,1	5,3
AC_185	346771	6070846	54° 45.686'N	005° 22.890'W	148	0,151	127,169	259,991	142,4	6,8
AC_186	347331	6069825	54° 45.146'N	005° 22.336'W	152	1,164	128,333	258,827	149,3	0,6
AC_187	347507	6069514	54° 44.982'N	005° 22.163'W	156	0,357	128,690	258,470	148,7	7,4
Donaghadee-Port_Kale_No3_Telegraph_Cable_OOS	347610	6069376	54° 44.909'N	005° 22.062'W	157	0,173	128,863	258,297	141,3	0,0
AC_188	347982	6068878	54° 44.648'N	005° 21.700'W	152	0,621	129,485	257,676	141,3	6,7
AC_189	348499	6067986	54° 44.176'N	005° 21.191'W	158	1,031	130,516	256,644	148,0	3,4

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_190	348663	6067738	54° 44.046'N	005° 21.030'W	163	0,297	130,813	256,347	144,6	8,9
AC_191	348795	6067449	54° 43.893'N	005° 20.898'W	159	0,318	131,131	256,029	153,5	17,6
Donaghadee-Port_Kale_No4_Coax_Cable_OOS	348813	6067301	54° 43.813'N	005° 20.877'W	157	0,149	131,280	255,880	171,1	0,0
AC_192	348835	6067128	54° 43.720'N	005° 20.852'W	155	0,174	131,455	255,706	171,1	3,8
AC_193	348878	6066900	54° 43.598'N	005° 20.804'W	155	0,232	131,686	255,474	167,3	1,5
AC_194	348932	6066651	54° 43.465'N	005° 20.746'W	151	0,255	131,942	255,219	165,8	12,0
AC_195	349024	6066448	54° 43.357'N	005° 20.654'W	161	0,223	132,164	254,996	153,8	5,4
AC_196	349128	6066265	54° 43.261'N	005° 20.552'W	164	0,210	132,374	254,786	148,4	5,0
AC_197	349253	6065993	54° 43.116'N	005° 20.427'W	161	0,300	132,674	254,486	153,4	2,3
AC_198	349395	6065713	54° 42.968'N	005° 20.286'W	160	0,314	132,988	254,173	151,2	1,0
AC_199	349540	6065415	54° 42.810'N	005° 20.142'W	162	0,332	133,320	253,841	152,1	19,4
AC_200	349967	6064993	54° 42.590'N	005° 19.731'W	162	0,601	133,921	253,240	132,8	18,0
AC_201	350098	6064739	54° 42.456'N	005° 19.602'W	162	0,285	134,206	252,955	150,8	6,1
AC_202	350234	6064534	54° 42.348'N	005° 19.469'W	162	0,247	134,452	252,708	144,7	2,3
AC_203	350590	6063943	54° 42.036'N	005° 19.119'W	163	0,690	135,142	252,018	147,0	2,6
AC_204	350826	6063508	54° 41.806'N	005° 18.886'W	164	0,494	135,637	251,524	149,6	20,2
AC_205	350866	6063234	54° 41.659'N	005° 18.841'W	164	0,278	135,914	251,246	169,8	4,6
AC_206	350930	6062957	54° 41.511'N	005° 18.773'W	162	0,284	136,198	250,962	165,2	19,9
Cable Unknown_(3)	350981	6062878	54° 41.469'N	005° 18.723'W	160	0,094	136,293	250,868	145,3	0,0
Scotland-North_Ireland_1_Cable_IS	351058	6062757	54° 41.405'N	005° 18.647'W	157	0,144	136,436	250,724	145,3	0,0
AC_207	351206	6062527	54° 41.284'N	005° 18.503'W	161	0,273	136,709	250,451	145,3	18,3
Cable Unknown_(4)	351217	6062485	54° 41.261'N	005° 18.491'W	161	0,044	136,753	250,407	163,7	0,0
AC_208	351261	6062314	54° 41.170'N	005° 18.445'W	159	0,177	136,930	250,231	163,7	20,4
Donaghadee-	351248	6062182	54°41.099'N	005°18.453'W	163	0,133	137,063	250,098	184,1	0,0

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
Port_Kale_No2_Telegraph_Cable_OOS										
AC_209	351241	6062118	54° 41.064'N	005° 18.458'W	163	0,064	137,127	250,034	184,1	8,6
AC_210	351251	6061912	54° 40.954'N	005° 18.443'W	165	0,206	137,333	249,828	175,4	2,8
AC_211	351250	6061639	54° 40.806'N	005° 18.435'W	165	0,273	137,606	249,555	178,2	17,7
AC_212	351313	6061441	54° 40.701'N	005° 18.371'W	166	0,208	137,814	249,347	160,6	18,6
AC_213	351434	6061275	54° 40.614'N	005° 18.253'W	165	0,206	138,019	249,141	142,0	6,2
AC_214	351624	6061067	54° 40.505'N	005° 18.070'W	163	0,281	138,301	248,860	135,7	13,8
AC_215	351862	6060907	54° 40.423'N	005° 17.843'W	158	0,287	138,588	248,573	122,0	18,8
AC_216	351985	6060746	54° 40.338'N	005° 17.724'W	155	0,203	138,791	248,370	140,8	12,2
AC_217	352131	6060437	54° 40.174'N	005° 17.579'W	163	0,342	139,133	248,028	152,9	18,8
AC_218	352303	6060258	54° 40.081'N	005° 17.414'W	163	0,248	139,381	247,779	134,1	8,8
AC_219	352430	6060079	54° 39.986'N	005° 17.290'W	170	0,220	139,601	247,560	142,9	5,8
AC_220	352602	6059881	54° 39.883'N	005° 17.125'W	161	0,262	139,863	247,298	137,1	5,0
AC_221	352851	6059539	54° 39.703'N	005° 16.883'W	155	0,423	140,286	246,875	142,1	7,4
AC_222	352949	6059358	54° 39.607'N	005° 16.787'W	156	0,205	140,491	246,669	149,5	2,0
AC_223	353057	6059143	54° 39.493'N	005° 16.680'W	156	0,241	140,732	246,428	151,6	2,7
AC_224	353144	6058946	54° 39.389'N	005° 16.593'W	155	0,215	140,947	246,213	154,3	12,5
AC_225	353220	6058566	54° 39.185'N	005° 16.511'W	156	0,388	141,336	245,825	166,8	1,6
AC_226	353275	6058243	54° 39.012'N	005° 16.450'W	158	0,327	141,663	245,498	168,4	10,6
AC_227	353388	6057939	54° 38.850'N	005° 16.335'W	160	0,325	141,988	245,173	157,8	0,3
AC_228	353513	6057607	54° 38.674'N	005° 16.209'W	162	0,354	142,342	244,819	157,5	0,7
AC_229	353682	6057143	54° 38.426'N	005° 16.038'W	166	0,495	142,837	244,324	158,1	6,3
AC_230	353804	6056643	54° 38.159'N	005° 15.910'W	167	0,514	143,351	243,810	164,4	6,7
AC_231	353966	6056209	54° 37.928'N	005° 15.747'W	169	0,463	143,814	243,347	157,8	4,9
AC_232	354044	6055926	54° 37.777'N	005° 15.666'W	166	0,294	144,108	243,053	162,7	5,0



ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_233	354105	6055598	54° 37.602'N	005° 15.600'W	166	0,333	144,441	242,720	167,7	7,6
AC_234	354220	6055242	54° 37.412'N	005° 15.482'W	164	0,374	144,815	242,345	160,1	0,7
AC_235	354348	6054868	54° 37.212'N	005° 15.352'W	162	0,396	145,211	241,950	159,4	7,1
AC_236	354443	6054402	54° 36.963'N	005° 15.250'W	160	0,475	145,686	241,474	166,5	16,3
AC_237	354543	6054214	54° 36.864'N	005° 15.152'W	159	0,213	145,899	241,262	150,3	14,8
AC_238	354600	6053967	54° 36.731'N	005° 15.091'W	158	0,253	146,152	241,008	165,1	9,6
AC_239	354683	6053768	54° 36.625'N	005° 15.008'W	158	0,216	146,369	240,792	155,5	4,4
AC_240	354747	6053576	54° 36.523'N	005° 14.943'W	158	0,203	146,571	240,589	159,9	11,2
AC_241	354806	6053100	54° 36.268'N	005° 14.874'W	158	0,479	147,051	240,110	171,1	0,6
AC_242	354834	6052888	54° 36.154'N	005° 14.842'W	157	0,214	147,264	239,896	170,5	12,0
AC_243	354818	6052673	54° 36.038'N	005° 14.850'W	150	0,216	147,480	239,680	182,5	11,5
AC_244	354759	6052464	54° 35.924'N	005° 14.899'W	148	0,217	147,697	239,463	194,0	7,4
AC_245	354636	6052179	54° 35.769'N	005° 15.005'W	163	0,310	148,008	239,153	201,4	18,7
AC_246	354620	6051974	54° 35.658'N	005° 15.014'W	161	0,206	148,214	238,947	182,7	20,2
AC_247	354681	6051755	54° 35.541'N	005° 14.951'W	158	0,227	148,440	238,720	162,6	6,4
AC_248	354856	6051323	54° 35.311'N	005° 14.776'W	160	0,467	148,907	238,254	156,2	18,1
AC_249	354875	6051047	54° 35.162'N	005° 14.750'W	158	0,277	149,184	237,977	174,2	4,6
AC_250	354915	6050775	54° 35.017'N	005° 14.704'W	157	0,275	149,459	237,702	169,6	19,6
AC_251	355056	6050511	54° 34.877'N	005° 14.565'W	155	0,299	149,758	237,403	150,1	11,9
AC_252	355200	6050340	54° 34.787'N	005° 14.427'W	156	0,223	149,981	237,180	138,2	3,1
AC_253	355425	6050040	54° 34.629'N	005° 14.209'W	158	0,376	150,357	236,804	141,2	8,9
AC_254	355736	6049457	54° 34.321'N	005° 13.904'W	159	0,660	151,017	236,144	150,1	8,8
AC_255	355873	6049065	54° 34.112'N	005° 13.765'W	160	0,416	151,433	235,728	158,9	5,0
AC_256	356219	6048296	54° 33.703'N	005° 13.422'W	149	0,843	152,276	234,884	153,9	9,7
AC_257	356491	6047893	54° 33.491'N	005° 13.158'W	149	0,486	152,762	234,398	144,2	6,7

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_258	356613	6047656	54° 33.365'N	005° 13.038'W	150	0,267	153,029	234,132	150,9	18,0
AC_259	356646	6047455	54° 33.258'N	005° 13.001'W	147	0,203	153,232	233,928	168,9	17,7
AC_260	356616	6047254	54° 33.149'N	005° 13.023'W	144	0,204	153,436	233,724	186,6	14,8
AC_261	356529	6047051	54° 33.038'N	005° 13.098'W	140	0,220	153,656	233,504	201,4	19,8
AC_262	356389	6046902	54° 32.955'N	005° 13.223'W	138	0,205	153,861	233,299	221,2	18,1
AC_263	356258	6046621	54° 32.801'N	005° 13.336'W	140	0,310	154,171	232,989	203,1	15,4
AC_264	356185	6046181	54° 32.563'N	005° 13.392'W	139	0,446	154,617	232,543	187,7	1,9
AC_265	356119	6045858	54° 32.388'N	005° 13.443'W	138	0,330	154,947	232,214	189,6	3,0
AC_266	356073	6045547	54° 32.220'N	005° 13.476'W	141	0,315	155,261	231,899	186,6	13,7
AC_267	356094	6045317	54° 32.096'N	005° 13.450'W	145	0,231	155,492	231,669	173,0	11,1
AC_268	356062	6045003	54° 31.926'N	005° 13.471'W	146	0,316	155,808	231,353	184,0	17,1
AC_269	356110	6044761	54° 31.797'N	005° 13.419'W	137	0,246	156,054	231,107	167,0	17,0
AC_270	356414	6044194	54° 31.497'N	005° 13.121'W	140	0,644	156,698	230,463	150,0	1,2
AC_271	356628	6043814	54° 31.296'N	005° 12.911'W	141	0,436	157,134	230,027	148,8	6,1
AC_272	356785	6043595	54° 31.180'N	005° 12.760'W	143	0,270	157,404	229,757	142,7	19,9
AC_273	356859	6043331	54° 31.039'N	005° 12.684'W	136	0,274	157,678	229,482	162,6	3,4
AC_274	356942	6042949	54° 30.835'N	005° 12.596'W	138	0,391	158,069	229,092	166,0	11,3
AC_275	356951	6042375	54° 30.525'N	005° 12.570'W	141	0,574	158,643	228,517	177,2	11,5
AC_276	356876	6041973	54° 30.308'N	005° 12.628'W	146	0,409	159,052	228,109	188,8	19,1
AC_277	357081	6040613	54° 29.578'N	005° 12.399'W	141	1,376	160,428	226,733	169,6	1,0
AC_278	357229	6039728	54° 29.104'N	005° 12.236'W	140	0,897	161,325	225,836	168,7	14,4
AC_279	357017	6037230	54° 27.754'N	005° 12.360'W	141	2,508	163,832	223,328	183,1	16,2
AC_280	356877	6036866	54° 27.556'N	005° 12.479'W	136	0,390	164,222	222,938	199,2	16,4
AC_281	356583	6036481	54° 27.343'N	005° 12.740'W	124	0,485	164,707	222,454	215,6	2,9
AC_282	356201	6035925	54° 27.037'N	005° 13.077'W	127	0,675	165,382	221,779	212,7	4,2

ID (Position Name / Event)	WGS84 - UTM 30 N		WGS84		Water Depth referred to LAT (m)	Geodetic				Turning Angle (deg)
	Easting	Northing	Latitude	Longitude		Partial Distance (km)	KP (km) from Ardneil	RKP (km) from Wirral	Bearing (deg)	
AC_283	355996	6035670	54° 26.897'N	005° 13.259'W	125	0,327	165,708	221,452	216,9	15,7
LANIS_2_Cable_IS	355775	6035512	54° 26.808'N	005° 13.459'W	121	0,272	165,980	221,180	232,7	0,0
AC_284	355148	6035065	54° 26.556'N	005° 14.025'W	133	0,770	166,751	220,410	232,7	18,7
AC_285	354674	6034407	54° 26.193'N	005° 14.444'W	124	0,811	167,562	219,599	214,0	20,5
AC_286	354369	6033289	54° 25.586'N	005° 14.693'W	119	1,159	168,720	218,440	193,5	16,7
AC_287	354395	6032198	54° 24.998'N	005° 14.636'W	121	1,092	169,812	217,348	176,8	0,3
AC_288	354416	6031520	54° 24.633'N	005° 14.597'W	118	0,678	170,491	216,670	176,4	1,1
AC_289	354435	6029736	54° 23.672'N	005° 14.528'W	111	1,785	172,275	214,885	177,6	3,4
AC_290	354463	6029322	54° 23.450'N	005° 14.489'W	108	0,415	172,690	214,471	174,2	4,9
AC_291	354458	6028995	54° 23.273'N	005° 14.484'W	112	0,327	173,018	214,143	179,1	3,8
AC_292	354483	6028508	54° 23.011'N	005° 14.447'W	112	0,488	173,505	213,655	175,3	1,3
AC_293	354567	6025426	54° 21.352'N	005° 14.279'W	110	3,083	176,588	210,572	176,6	19,8

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