DEEPSEA
Fibre Networks Ltd
Specialists in Sub-Sea Cable Systems

Farice – IRIS Subsea Cable

Iceland to Ireland

APPLICATION FOR FORESHORE LICENCE

FOR MARINE SURVEY & SITE INVESTIGATION WORKS AT BALLYLOUGHANE STRAND, RENMORE, CO. GALWAY & GALWAY BAY

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1.0 INTRODUCTION

1.1 It is planning to construct a new sub-sea telecoms cable system, IRIS, linking Iceland to Ireland, from a landfall on the Reykjanes Peninsula to a landfall on the west coast of Ireland as shown in Figure 1 below.

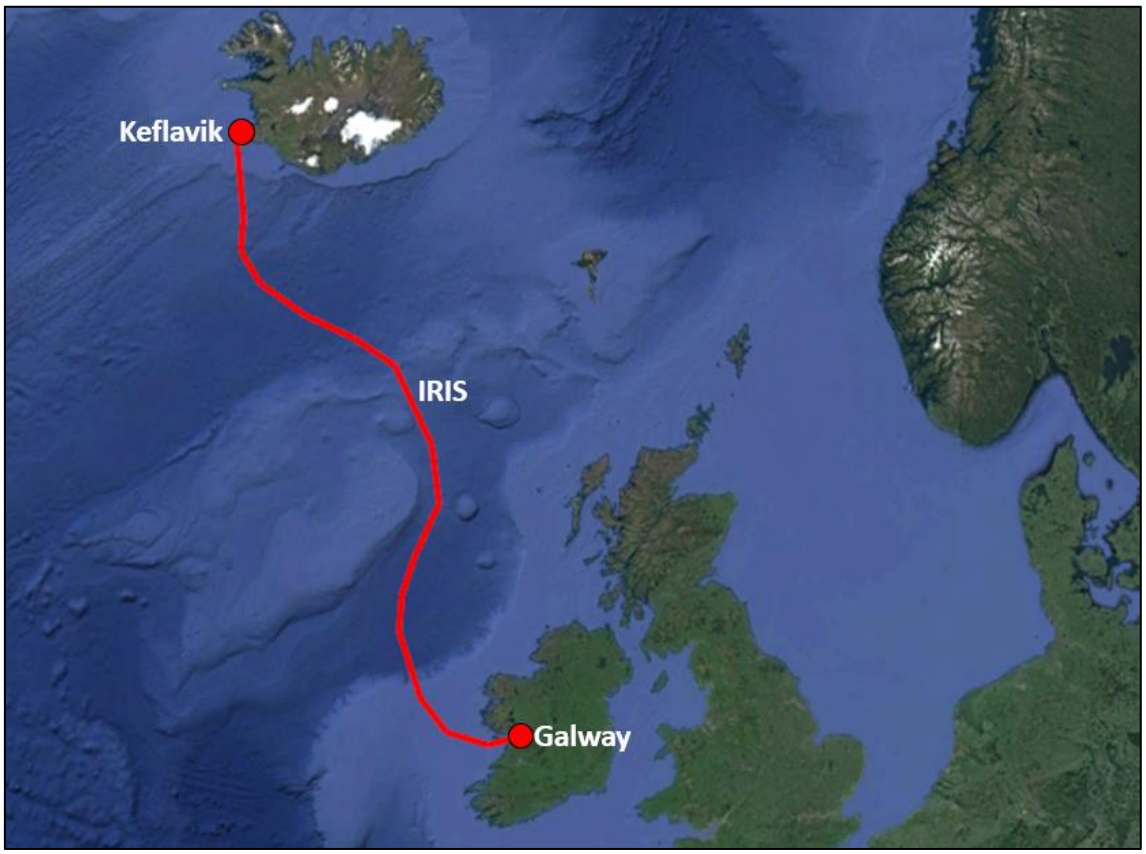

Figure 1: Proposed IRIS Subsea Cable System

1.2 The proposed survey route arises from discussions between Farice ehf (Ltd) and DeepSea Fibre Neworks Ltd. Farice ehf (Ltd) was founded in November 2002 by a number telecommunications companies in Iceland and the Faroe Islands as well as the Icelandic State in order to build and operate the FARICE-1 submarine cable that was put into service in January 2004. The second cable, DANICE, was put into service in September 2009. The company is the now main provider of wholesale capacity in and out of Iceland. The Icelandic state has 100% of the shares under its ownership.

1.3 This planning repot has been prepared by MDM Ltd and forms part of an application for a Foreshore Licence for Marine Survey and Site Investigations for route options traversing Galway Bay to the North or South of the Aran Islands. The planned landfall is at Ballyloughane Strand, Renmore, Co. Galway. The works will be carried

out predominantly by seaborne electronic equipment (geophysical survey) with some selective sampling of the seabed (geotechnical survey). Once the results of the survey are obtained and analysed a preferred route corridor will be determined, design and method statements will be developed and a final Route Position List (RPL) will be defined as part of a further submission for a Foreshore Licence for installation works.

2.0 PLANNED SURVEY ROUTE IN IRISH WATERS

Offshore Section

2.1 The proposed survey is divided into four sections in order to determine an optimum route for the proposed cable system to traverse Galway Bay. The general lines of the proposed offshore survey corridors are shown on an Admiralty Chart base in Figure 2 overleaf.

2.2 The four survey sections are generally as follows;

- Section A – 375m wide survey corridor heading south-west from Ballyloughane Strand, Renmore and then generally westwards until it ends at a point approximately 13.9km from the landfall.
- Section B – 500m wide survey corridor from the end of Section A heading west out of Galway Bay, through the North Sound and finishing at the 12 Mile Limit. Section B is approximately 80.4km long.
- Section C - 500m wide survey corridor from the end of Section A heading south-west out of Galway Bay, through the South Sound and then turning north-west and running parallel to the Aran Islands before turning west and finishing at the 12 Mile Limit. Section C is approximately 91km long.
- Section D - 500m wide survey corridor from an intersection point with Section B to the north west of Inishmore, heading south west to intersect with Section C at a point to the west of Inishmore. Section D is approximately 9.6km long.

2.3 The proposed Route Position Lists for the four survey sections are presented in Tables 1-4.

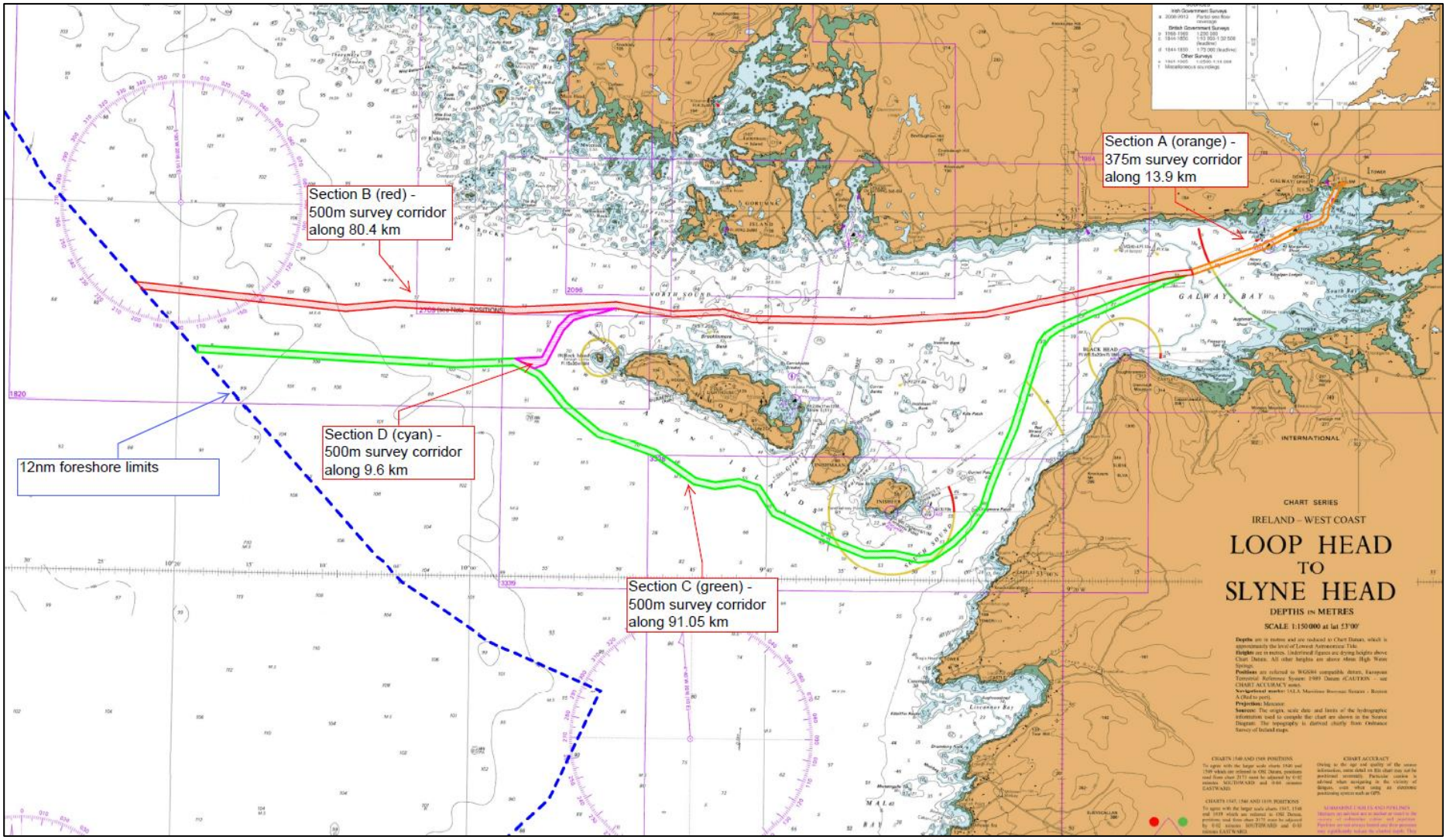

Figure 2: Proposed Survey Corridors

Table 1: Section A – 375m Wide Survey Corridor Centred on Route Below

Idx	Length	Total Length	Latitude	Longitude
1	341.55 m	---	53° 16' 14.7535" N	9° 01' 07.9290" W
2	396.6 m	341.55 m	53° 16' 06.9877" N	9° 01' 21.0380" W
3	417.32 m	738.15 m	53° 15' 56.8229" N	9° 01' 34.0929" W
4	509.17 m	1.155 km	53° 15' 44.2947" N	9° 01' 42.4778" W
5	405.68 m	1.665 km	53° 15' 30.0525" N	9° 01' 56.2741" W
6	87.007 m	2.07 km	53° 15' 19.2903" N	9° 02' 08.7952" W
7	73.522 m	2.157 km	53° 15' 16.7165" N	9° 02' 10.6942" W
8	249.86 m	2.231 km	53° 15' 14.4583" N	9° 02' 11.9387" W
9	94.034 m	2.481 km	53° 15' 06.6779" N	9° 02' 15.5871" W
10	105.91 m	2.575 km	53° 15' 03.6907" N	9° 02' 16.5429" W
11	198.38 m	2.681 km	53° 15' 00.2654" N	9° 02' 16.6467" W
12	205.3 m	2.879 km	53° 14' 53.8481" N	9° 02' 16.6306" W
13	152.01 m	3.084 km	53° 14' 48.1391" N	9° 02' 22.2863" W
14	145.58 m	3.236 km	53° 14' 44.4402" N	9° 02' 27.6874" W
15	371.51 m	3.382 km	53° 14' 41.6711" N	9° 02' 34.0377" W
16	362.56 m	3.753 km	53° 14' 36.5845" N	9° 02' 52.1887" W
17	311.7 m	4.116 km	53° 14' 32.8810" N	9° 03' 10.7390" W
18	749.48 m	4.428 km	53° 14' 30.0056" N	9° 03' 26.8493" W
19	184.43 m	5.177 km	53° 14' 22.7413" N	9° 04' 05.4056" W
20	1.226 km	5.362 km	53° 14' 20.0720" N	9° 04' 14.2989" W
21	1.485 km	6.588 km	53° 14' 01.9734" N	9° 05' 13.1330" W
22	187.26 m	8.073 km	53° 13' 40.0421" N	9° 06' 24.3729" W
23	3.866 km	8.26 km	53° 13' 38.0187" N	9° 06' 33.8874" W
24	1.733 km	12.127 km	53° 12' 56.1922" N	9° 09' 50.2829" W
25	---	13.86 km	53° 12' 37.4890" N	9° 11' 18.3081" W

Table 2: Section B – 500m Wide Survey Corridor Centred on Route Below

Idx	Length	Total Length	Y (View Proj)	X (View Proj)
1	638.88 m	---	53° 12' 37.4890" N	9° 11' 18.3081" W
2	1.277 km	638.88 m	53° 12' 34.9517" N	9° 11' 52.4726" W
3	4.59 km	1.916 km	53° 12' 29.8788" N	9° 13' 00.7723" W
4	9.38 km	6.506 km	53° 11' 57.8962" N	9° 17' 02.2747" W
5	8.676 km	15.886 km	53° 10' 51.4781" N	9° 25' 15.1959" W
6	9.048 km	24.562 km	53° 10' 31.8395" N	9° 33' 01.2156" W
7	2.236 km	33.611 km	53° 10' 34.5782" N	9° 41' 08.3680" W
8	3.805 km	35.847 km	53° 10' 52.3027" N	9° 43' 05.1192" W
9	4.37 km	39.652 km	53° 10' 45.8665" N	9° 46' 29.6985" W
10	3.503 km	44.022 km	53° 11' 07.0548" N	9° 50' 22.3604" W
11	4.187 km	47.525 km	53° 10' 59.0327" N	9° 53' 30.5335" W
12	9.052 km	51.712 km	53° 10' 51.4361" N	9° 57' 15.6546" W
13	3.733 km	60.765 km	53° 11' 03.0079" N	10° 05' 22.7291" W
14	15.945 km	64.497 km	53° 10' 50.7476" N	10° 08' 42.6973" W
15	---	80.442 km	53° 11' 37.7459" N	10° 22' 57.8399" W

Table 3: Section C – 500m Wide Survey Corridor Centred on Route Below

Idx	Length	Total Length	Latitude	Longitude
1	10.361 km	---	53° 12' 34.9517" N	9° 11' 52.4726" W
2	967.86 m	10.361 km	53° 10' 18.8744" N	9° 20' 22.4504" W
3	918.8 m	11.329 km	53° 10' 01.3821" N	9° 21' 05.6621" W
4	6.439 km	12.248 km	53° 09' 37.0608" N	9° 21' 34.0881" W
5	4.84 km	18.687 km	53° 06' 18.1672" N	9° 23' 16.9705" W
6	1.644 km	23.527 km	53° 03' 53.0367" N	9° 24' 54.4694" W
7	1.853 km	25.171 km	53° 03' 02.2865" N	9° 25' 20.8593" W
8	1.831 km	27.024 km	53° 02' 13.4490" N	9° 26' 18.5319" W
9	1.874 km	28.855 km	53° 01' 31.7847" N	9° 27' 28.3613" W
10	981.73 m	30.728 km	53° 00' 57.6851" N	9° 28' 51.4823" W
11	1.834 km	31.71 km	53° 00' 53.2169" N	9° 29' 43.6194" W
12	2.267 km	33.544 km	53° 01' 04.8921" N	9° 31' 20.0622" W
13	2.553 km	35.811 km	53° 01' 03.8148" N	9° 33' 21.6603" W
14	4.931 km	38.364 km	53° 01' 33.3756" N	9° 35' 29.5438" W
15	2.258 km	43.295 km	53° 02' 42.4237" N	9° 39' 28.0737" W
16	1.523 km	45.553 km	53° 03' 43.0779" N	9° 40' 35.6155" W
17	1.822 km	47.076 km	53° 03' 57.2314" N	9° 41' 53.9705" W
18	1.552 km	48.898 km	53° 03' 48.5249" N	9° 43' 30.7300" W
19	3.802 km	50.45 km	53° 03' 58.3993" N	9° 44' 52.4652" W
20	4.43 km	54.252 km	53° 05' 07.3714" N	9° 47' 41.5653" W
21	3.308 km	58.682 km	53° 05' 53.5866" N	9° 51' 26.8706" W
22	3.034 km	61.99 km	53° 07' 00.6057" N	9° 53' 45.5283" W
23	2.077 km	65.024 km	53° 08' 13.5381" N	9° 55' 34.6826" W
24	4.349 km	67.101 km	53° 08' 43.7084" N	9° 57' 14.5323" W
25	19.603 km	71.449 km	53° 08' 36.6549" N	10° 01' 08.1938" W
26	---	91.053 km	53° 09' 03.5560" N	10° 18' 41.9976" W

Table 4: Section D – 500m Wide Survey Corridor Centred on Route Below

Idx	Length	Total Length	Latitude	Longitude
1	3.489 km	---	53° 11' 07.0548" N	9° 50' 22.3604" W
2	1.208 km	3.489 km	53° 10' 34.6199" N	9° 53' 22.3195" W
3	2.622 km	4.697 km	53° 10' 06.3723" N	9° 54' 07.2695" W
4	303.01 m	7.319 km	53° 08' 50.9844" N	9° 55' 11.9361" W
5	2.013 km	7.622 km	53° 08' 46.3596" N	9° 55' 26.3102" W
6	---	9.636 km	53° 08' 43.7084" N	9° 57' 14.5323" W

Inshore Section

2.4 The general line of the inshore section of the proposed survey route is shown on an Admiralty Chart base in Figure 3. The route has a landfall at Ballyloughane Strand, Renmore and heads southwest from the landfall staying west of Hare Island and to the east of Mutton Island reaching 10 metres water depth at approximately kilometre point (KP) 5. The route continues in a general southwest direction until it reaches Turning Point 25 (TP25). At TP25 the route divides into Sections B & C as described in Section 2.2.

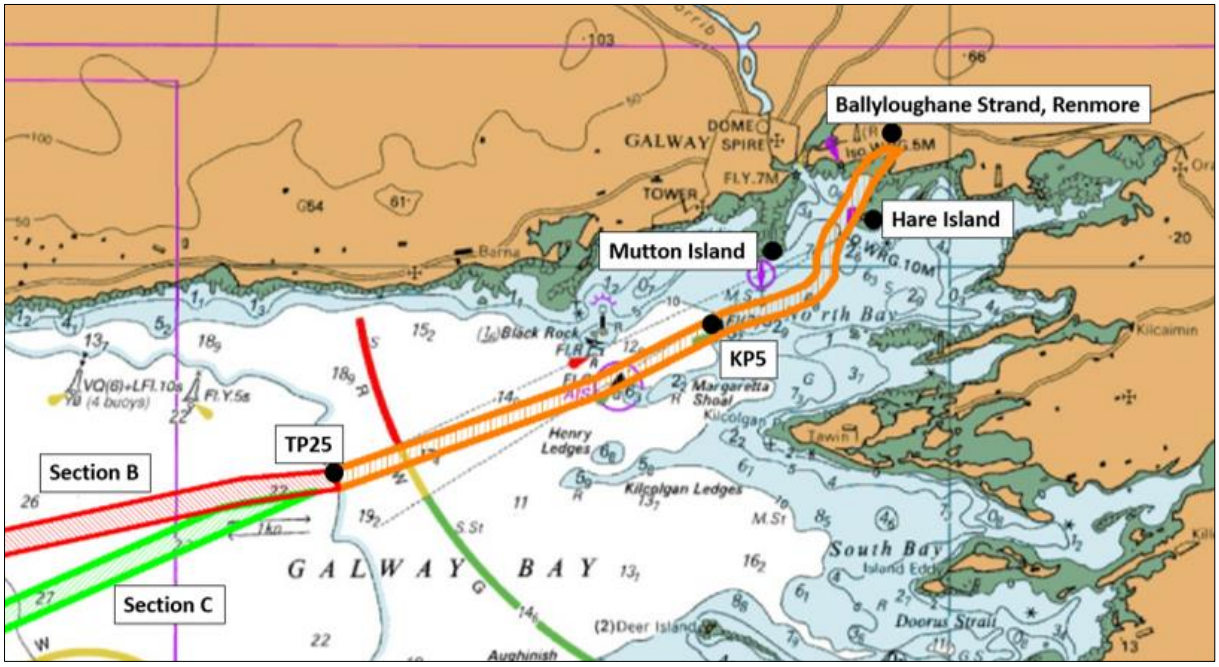

Figure 3: Proposed Inshore Survey Corridor

Landfall

2.5 The proposed landfall is at Ballyloughane Strand, Renmore, Co. Galway and the general location is shown in Figure 4.

Figure 4: Landfall Location
Source: Ordnance Survey Ireland (http://map.geohive.ie)

Nearshore Survey Corridor and Landfall Location

2.6 The location of the nearshore survey corridor and the landfall at Ballyloughane Strand is shown on the 6" to 1 mile Ordnance Survey map and the 1/2,500 Ordnance Survey map in Figures 5 & 6 respectively.

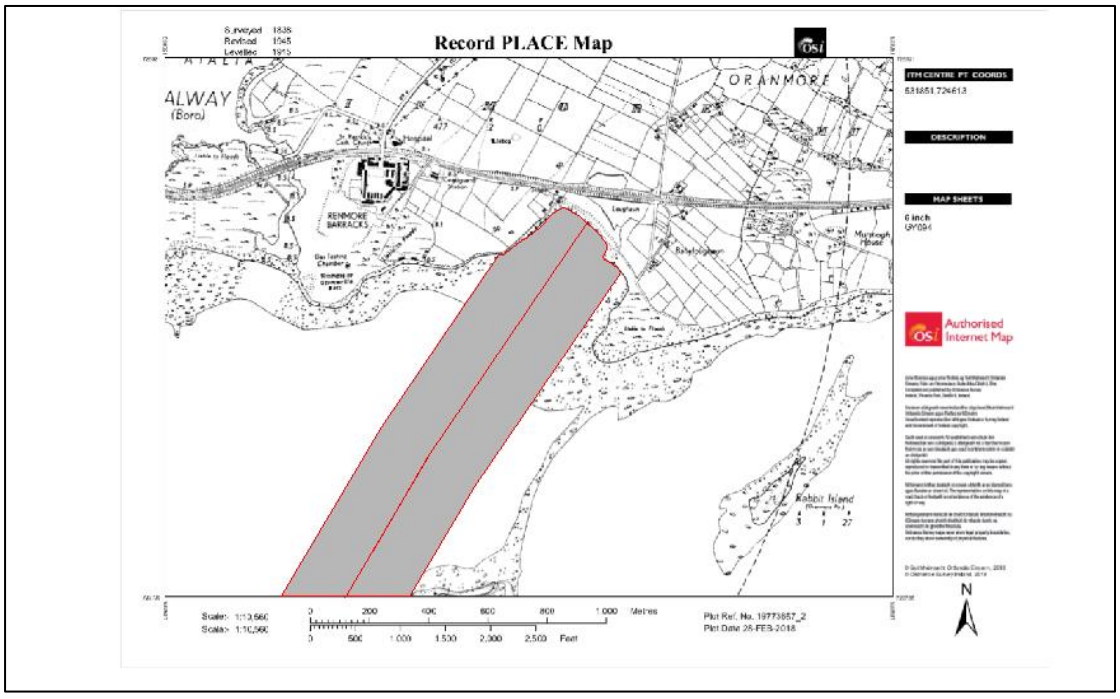

Figure 5 – Landfall Location on 6" Ordnance Survey Map

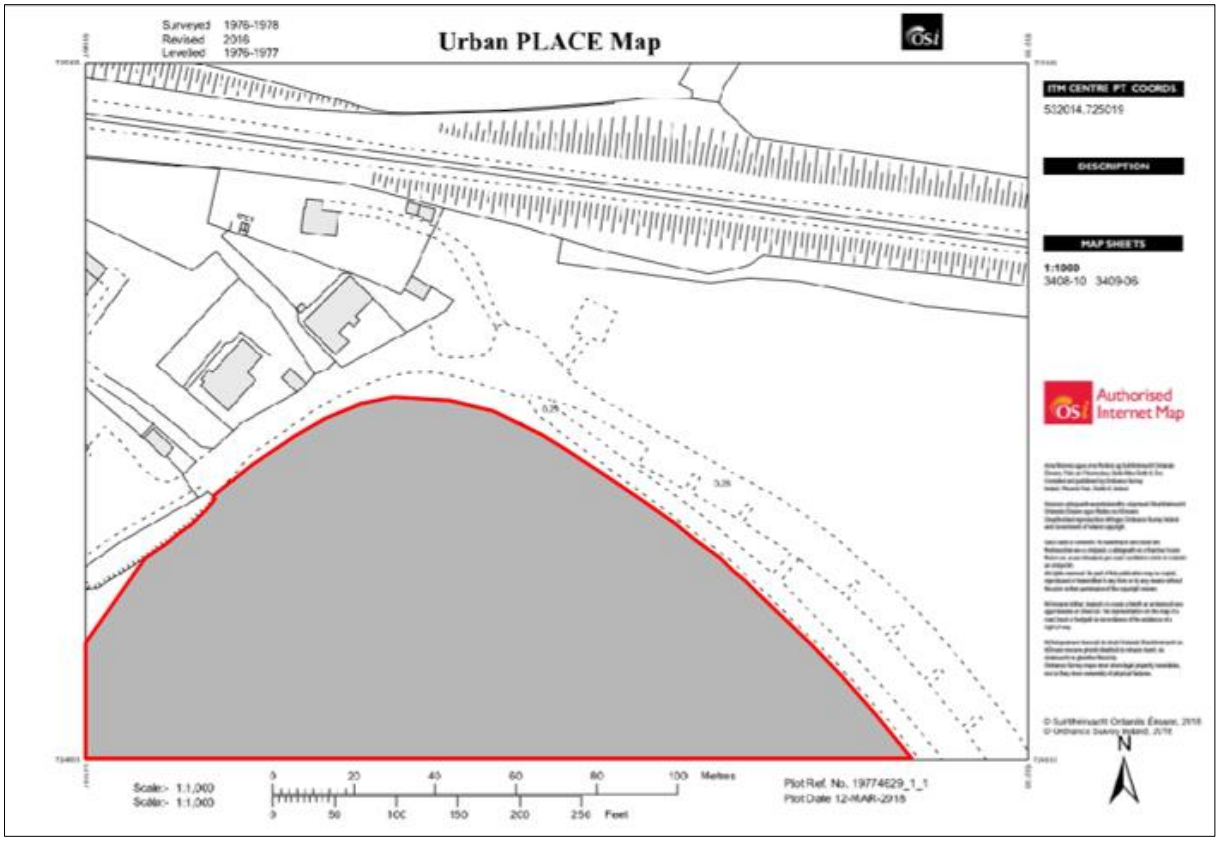

Figure 6 – Landfall Location on 1/1,000 Ordnance Survey Map

2.7 The Ordnance Survey Maps are reproduced in Drawings 1334-A-103, 1334-A-104 and included in Appendix 1.

3.0 PROPOSED MARINE SURVEY & SITE INVESTIGATIONS

3.1 The principal objective of the Marine Survey & Site Investigations is to ascertain a feasible and safe route for cable system design, deployment, survivability and subsequent maintenance with due regard for environmental and ecological considerations. The survey will also enable decisions to be made on cable armouring and burial. The survey will identify all route features, obstacles and cable hazards and provide detailed information to support cable route and installation engineering. The site investigations will provide "ground-truthing" of the seabed along the route.

3.2 The survey operations will be broken down into separate but overlapping areas, with boundaries defined by water depth as specified in the technical requirements outlined below. These water depth boundaries may be adjusted due to suitability of the survey vessel(s) and survey gear. The survey and survey line spacing will be designed to ensure adequate coverage and overlap of geophysical measurements. For the route survey, the sidescan ranges will be limited to those providing the greatest resolution possible (able to resolve a 0.5m object or better), while following the requisite line spacing and overlap. The maximum speeds outlined will be used as guidelines. Bathymetry data collection will, at minimum, comply with the requirements in this document and with International Hydrographic Office standards (S44).

3.3 For swathe bathymetry, "20% overlap" signifies that adjacent acquisition swathes within the survey corridor overlap by 20%. For side scan sonar (SSS), 100% overlap requires two passes of complete coverage over a given area of sea-floor, with the two passes each ensonifying the sea-floor from opposite directions to ensure targets are adequately imaged.

3.4 The basic survey equipment is to comply with the requirements of the Underwater Archaeology Unit. The requirements are as follows;

<u>General requirements for a geophysical survey for archaeological purposes:</u>

<u>Side Scan Sonar:</u>

- For archaeological purposes, the Side Scan Sonar should have an operational frequency of 410/500 khz.

- Side scan should be set at 50m survey line spacing
- This should not be slant-range corrected
- There should be 100% coverage of sites and therefore overlap of areas may be required.

It is proposed that in shallow water (0-15 metre water depth) the line spacing may be reduced to 25 metres. In deeper water (15 to 1500 metres) the line spacing may be increased to 150 metres whilst maintaining the requisite seabed coverage.

Magnetometer:

- A magnetometer should always be used in tandem with side scan sonar
- Proton or caesium magnetometer should be used as well as, again, using 50m side spacing
- This should be used with DGPS

Sub-bottom profiler (optional):

Sub-bottom profile information shall be required for both the inshore and shallow water sections of the route. Sub-bottom profile data shall be acquired on all lines of the proposed line plan so that an accurate interpretation of the geology can be obtained. Details of the preferred line plan can be found in Section 3.14.

The Survey Contractor shall recommend sub-bottom profiling equipment that typically resolves to twenty centimetres (0.2m) within the top three metres (3m) of the seabed. The equipment shall be capable of penetrating to a minimum of six metres (6m) in suitable seabed conditions. The Survey Contractor shall state the resolution of the proposed system for survey.

Vessel mounted sensors shall be fully compensated for heave. In-water sensors shall be dynamically positioned and steered along the predefined survey lines using industry standard techniques. In water depth less than one hundred metres (100m), equipment positioning may be determined using fixed layback to counteract poor acoustic positioning.
The system shall be capable of providing data in both digital and analogue form.

- If using a sub-bottom profiler then the Chirp system is the preferred one as this gives the ultimate resolution

- This should be used in conjunction with DGPS

General:

Track plots should also be recorded. Track plots should be superimposed onto a locational chart

All geophysical survey should be carried out by suitably qualified personnel. Preferably they should also have underwater archaeological experience. If this is not possible then the results must be viewed by a qualified archaeologist with experience in underwater archaeology.

A copy of the original data/traces as well as the interpreted results of the geophysics should be sent to the Underwater Archaeological Unit of DCHG. Further archaeological mitigation may be required once the data has been reviewed by DCHG.

Vessels should not travel faster than 4-5 knots when carrying out surveys.

3.5 In order to ensure data continuity, the following overlaps between survey regions are to be established as a minimum;

- Landfall Site Survey to Small Boat Survey – 50m overlap
- Small Boat Survey to Offshore Survey – 500m overlap

Landfall Site Survey & Site Investigations

3.6 A non-intrusive topographic and geophysical survey of the beach at Ballyloughane along the line of the proposed cable route is required from the carpark to the low water mark.

3.7 Site Investigations at Ballyloughane Strand will consist of;

- 3 Trial Pits on the beach. (2.5 metres target depth, excavated and immediately reinstated by JCB)
- Bar probes on the beach (effectively non-intrusive investigation)
- Bar probes from the Low Water Line to the 3m water depth contour. (effectively non-intrusive investigation)

3.8 The sampling required on the beach at Ballyloughane Strand will involve 3 No. Trial Pits at 50m centres starting seaward of the High Water Mark. The 3 No. Trial Pits will be excavated, logged, photographed and backfilled in a single intertidal period. The trial pits will be backfilled with the original excavated materials in the sequence in which they are excavated.

3.9 A summary Method Statement for excavation of the Trial Pits is as follows;

3 No. Trail Pits – JCB or equivalent small mechanical excavator.
– Maximum depth 2.5m.
– Excavate sand and place to one side.
– Excavate substrate and place separate from sand.
– Measure, log and photograph each Trial Pit.
- Backfill in sequence compacting with bucket of back-hoe as the backfilling proceeds.

3.10 The bar probes on the beach are simply to prove the depth of sand, gravel or soft material and are effectively non-intrusive.

Small Boat Survey

3.11 The area extending seaward from the low water mark and inshore of the safe working draft limits of the primary survey vessel will be accurately surveyed with a small craft using Multibeam Echosounder (MBES), sidescan sonar and sub-bottom profile equipment. Sub-bottom profile equipment will be able to discern the nature and density of the upper 3 metres of seabed and will be used on a non-interfering basis with other sounding systems. Tie-lines will be performed to verify primary survey data and will have a nominal spacing of 10 times the primary line spacing with a minimum of two tie-lines. A minimum of seven survey lines, based upon the Survey RPL, is required.

3.12 Features such as shallow reefs, surge channels, debris fields, archaeological features or anything that could be a hazard to the cable or installation team will be noted. General reconnaissance of the survey corridor beyond the planned survey lines and tie-lines may be necessary to describe the seabed as accurately as

possible. A line plan showing number of survey lines as a function of depth will be provided prior to start of survey operations.

Survey Area	Depth Range	Corridor	Min. # of Lines	Min. Overlap	Max. Speed
Small Boat	3m to 15m	350 - 500m	7	SSS: 100% MBES Bathy: 20%	4 knots

Table 6: Small Boat Survey Requirements

Offshore Survey

3.13 A continuous bathymetric swathe (Multibeam Echosounder), along with side scan sonar imagery and sub-bottom profile will be obtained, centred on the preliminary route and along all wing lines needed to complete the corridor coverage. A minimum depth accuracy of 0.5% is required. Sub-bottom equipment will be able to discern the nature and density of upper 3m of seabed, and is to be used on a non-interfering basis with other sounding systems. Additional sounding lines may be necessary to identify any obstacles or archaeological features that may be encountered, and/or to meet the overlap and corridor requirements.

Survey Area	Depth Range	Corridor	Min. # of Lines	Min. Overlap	Max. Speed
Offshore	> 15m	350 - 500m	3	SSS: 100% MBES Bathy:20%	4 knots

Table 7: Offshore Survey Requirements

Seabed Sampling

3.14 Seabed sampling will be required at locations covered by the Small Boat and Shallow Water Surveys.

3.15 A minimum of two attempts will be made at each sampling location to acquire a suitable seabed sample. If an acceptable sample is achieved on the first attempt, there is no need to perform a second attempt.

3.16 An acceptable sample is defined as;

- Grab Sample – recovery of approximately a full bucket of soils. Recovery of rocks and/or large size granular material will be taken as indication of a hard seabed and be deemed an acceptable sample.
- Gravity Core – recovery of no less than a 2m deep core of soil. If stiff or hard soils are encountered below 1m of seabed and are clearly indicated in the sample, a 1m+ soil sample will be deemed acceptable. Any sample site yielding less than 1m of recovery must be investigated a second time unless there is obvious damage to the coring equipment indicating a hard or rocky substrate.
- CPT – Penetration to the 2m target, but a maximum of 3m below seabed. Any push resulting in less than 2m penetration will warrant a second attempt.

Survey Area	Depth	Type	Avg. Spacing	No. of Samples
Small Boat	3 – 15 m	Grab Sampler	1 per 500 m	8
Offshore	> 15m	Gravity Corer (GC) or Cone Penetrometer (CPT) Grab Sampler (After GC/CPT Failure)	1 per 10km	45

Table 8: Seabed Sampling Requirements

3.17 The site investigations in the area from the Low Water Line to the 15m contour will be undertaken from a small vessel having the appropriate draft.

3.18 The site investigations seaward of the 15m contour will be undertaken from a larger sea-going vessel.

3.19 The marine survey and site investigations will be undertaken in compliance with best practice and having regard for the protection of marine mammals.

3.20 The marine survey and site investigations will be undertaken along the route line shown on the Foreshore Licence Map Drawings. However, a 500m wide route corridor is shown to allow for local diversions in the event of obstructions or other routing considerations.

3.21 The schedule of Site Investigations is set out in Table 9.

Survey Area	Depth	Type	Avg. Spacing
Landfall	HWM - LWM	Trial Pit	50 m
Landfall	HWM - LWM	Bar Probing	1 per 25 m

Table 9: Site Investigations Schedule

3.22 The overall scope of the Site Investigations is as follows

- Trial Pits — 3 No. on the beach
- Bar Probes — 24 No. on the beach
- Bar Probes contour — 20 No. from Low Water to the 3.0m
- Grab Samples — 6 No. from the 3m to the 15m contour
- Gravity Cores or Cone Penetration Tests — 45 No. from the 15m contour to the 12-Mile Limit

3.23 The Survey Control Measures prescribed in the Appropriate Assessment Screening Report (attached as Appendix 3) will be adhered to.

Underwater Video Survey

3.24 As outlined in the Nature Impact Statement sensitive subtidal communities were found within the vicinity of the proposed route within Galway Bay SAC in 2018. Virgularia mirabilis was known to be present in Inner Galway Bay and previous subtidal surveys were unable to locate the bed of Virgularia mirabilis. As discussed with Dr David Lyons of NPWS it is necessary to map the distribution and density of Virgularia mirabilis along the proposed survey corridor in order to select a route of least impact to Virgularia mirabilis within this narrow corridor area that is located between the Galway Port Company dredged channel to the North and intertidal/subtidal reef areas to the south.

3.25 The proposed survey will involve a series of drop-down videos to map the extent of the habitat. A series of transects will be carried out to confirm presence/absence and to map the boundary extent of the Virgularia mirabilis within this area of the SAC. These will be mapped in GIS and the proposed route alterations will be carried out in consultation with the design team and the marine biologist that will carry out the survey.

3.26 In addition, the proposed survey corridor is within the marine element of Inishmore Island SAC and the initially proposed optimal cable route is between several reef outcrops. Reef is a feature of interest of this SAC. In order to adequately assess the potential impact of the proposed main lay and assist in the selection of potential routes between the reef outcrops, an additional series of georeferenced video drops are proposed within Inishmore Island SAC reef areas. The results from both video surveys will be discussed with NPWS prior to the final layout of the main lay route."

4.0 SURVEY EQUIPMENT PARAMETERS

Equipment and Procedures

4.1 The marine survey will be carried out in compliance with the "*Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters,*" and with the "*General Requirements for a Geophysical Survey for Archaeological Purposes*," and in accordance with the Survey Control Measures prescribed in the Appropriate Assessment Screening Report (attached as Appendix 3).

4.2 The survey equipment acoustic properties have the following characteristics;

Equipment Type	**Frequency (Energy level in dB re 1 µPa)**
Dual Frequency Single Beam Echosounder – Reson Navisound 420	33 and 210kHz (168 – 174)
Dual Frequency Side Scan Sonar - Edgetech 4200 Sidescan Towfish	100 and 400kHz (226 effective) 100/400 kHz and 300/600 kHz
Sub-bottom Profiler - Geoacoustics 4 x 4 Hull-mounted SBP Pinger System	3 – 7.5kHz (-225)

4.3 In the case of the Small Boat Survey the survey line spacing will be set at 50m for the Side Scan Sonar. In deeper water the spacing will increase.

4.4 Specific soft-start procedures (to comply with the "*Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters*") will be developed and incorporated in the project execution plan before mobilisation.

4.5 The duration of noise-generating surveys will be reduced to the minimum necessary to collect results of sufficient quality.

4.6 The survey will be undertaken by a specialist survey vessel having experience of marine survey and having approved appropriate survey equipment.

4.7 Details of the survey vessel and of the survey equipment to be used will be made available prior to commencement of the survey. The data to be provided will include;

- Name of vessel
- Name of Captain
- Name of Client's Representative
- Contact details for the vessel
- Details of Multi-Beam Equipment including;
- The sound intensity, the frequency of pitch and the tone or bandwidth for the Echo Sounder, the Side Scan Sonar and the Sub-Bottom Profiler.

5.0 MARINE LIAISON & CONSULTATIONS

Sea Fisheries Protection Agency

5.1 It is proposed to contact the Sea Fisheries Protection Agency (SFPA) to seek advice regarding the timing of survey works to avoid clashing with spawning periods of fish in the area. This will reduce any potential for noise damage to larval and juvenile life stages of fish when they are more susceptible to noise damage than adults. Consideration of any possible impact on migratory fish patterns and timing will also be discussed.

5.2 It is proposed to appoint a Fisheries Liaison Officer for the inshore and offshore sections of the survey. The appointment of a Fisheries Liaison Officer would have the purpose of keeping commercial fishermen informed of the survey works including time lines, dates of sampling and locations of sampling vessels. The Fisheries Liaison Officer will also inform the survey team of commercial activity and locations of fishing nets or pots that may be impacted by the survey activities.

5.3 The Sea-Fisheries Protection Authority (SFPA) will be requested to advise on consultation with the relevant fishermen's organisations on details of the project.

National Parks & Wildlife Service

5.4 It is proposed to appoint a Marine Mammal Observer to be on board the survey vessel.

Irish Coast Guard

5.5 It is proposed to liaise with the Irish Coast Guard to arrange appropriate radio / nav-text broadcast warnings to advise shipping approaching the survey area.

Harbour Master at Galway Port

5.6 The Galway Port Harbour Master will be informed of the Plan of Work and of the planned start and estimated completion dates for the proposed survey works.

Marine Notice

5.7 It is proposed to publish a Marine Notice through the Marine Safety Directorate giving a general description of operations and approximate dates of commencement and completion.

6.0 MARINE ARCHAEOLOGY

6.1 A formal Marine Archaeological Assessment has been undertaken by Geomara Ltd and the report is presented in full in Appendix 2. The Non-Technical Summary of the Marine Archaeology Report is as follows;

The assessment comprises an introduction to the study area; and the identification of cultural heritage sites, features and deposits located along and close to the proposed survey route corridor. In order to provide a comprehensive assessment, an extensive desk-based study of the survey corridor was undertaken. The potential impact of the proposed scheme on the receiving environment is addressed and mitigation measures to ameliorate these impacts are presented.

*The assessment has identified two wreck sites (**W15898 & W17455**) within the proposed survey and site investigation corridor. In the surrounding area 15 other known shipwrecks have been recorded in the Shipwreck Inventory (Appendix 1). The precise locations of these shipwrecks are sometimes difficult to identify even when location details are present in the inventory. The sheer numbers of known and unknown wrecks recorded from the area means any proposed site investigations have the potential to impact on a wreck site or other related cultural heritage assets.*

Any site investigations on the seabed, foreshore or beach have the potential to impact unrecorded features, finds and deposits.

Consequently, given the results of the impact assessment the mitigation strategies outlined here detail the measures to be adopted in order to ameliorate any direct, indirect and secondary impacts that the proposed survey and site investigations may have on features of maritime cultural heritage interest. If these measures are employed it is envisaged that the survey and site investigations will have no impact on features of maritime cultural heritage interest.

The following mitigation recommendations are presented in connection with the proposed survey and site investigations:

1. *It is recommended that all sites of cultural heritage interest included in this report are avoided by the site investigations.*
2. *As the survey proceeds, processing and charting should be carried out in a 200m zone around all of the proposed site investigation sampling locations. The data and charts should be reviewed and analyzed by a licensed archaeologist for the presence of unrecorded seabed and subseabed archaeological features finds or deposits. Only where no such features are identified within the 200m zone surrounding the proposed sampling location will the sampling be allowed to proceed.*
3. *Archaeological analysis of the full data set from the geophysical and bathymetric pre installation surveys should be undertaken to both confirm the locations of any identified wreck sites, especially known sites within the survey corridor, such as* ***W15898 & W17455*** *and also to identify any potential unrecorded seabed and sub seabed maritime archaeological features or cultural heritage assets.*
4. *Due to the approximate location details for many shipwrecks in the inventory it is not recommended that the survey corridor be re-routed to avoid the two known wrecks.*
5. *Where the location of a wreck site is found during the survey and site investigations any proposed further development corridors should be re-routed to avoid them.*
6. *Archaeological monitoring of the grab sampling, gravity core, CPT, trial pits and bar probing should be undertaken in order to identify any previously unrecorded cultural heritage features.*
7. *The location of all of the proposed trial pits and probing on the beach and on the foreshore should avoid the seven sites and find spots noted during the storm damage mitigation report and detailed in this report.*
8. *All of the proposed trial pit excavations and probing on the beach and on the foreshore should be subject to full archaeological monitoring.*

9. *It is recommended that procedures should be put in place to ensure that any previously unrecorded cultural heritage assets encountered during the survey and site investigations should be assessed by a suitably qualified archaeologist and avoided by any future works*
10. *Should the proposed survey route be subject to further revision, details of these revisions should be forwarded to the project archaeologist for assessment.*
11. *On completion of the survey and site investigations a report will be produced summarising all archaeological aspects of the project and submitted to DCHG and the National Museum of Ireland.*

7.0 AA SCREENING AND NATURA IMPACT STATEMENT

7.1 An Appropriate Assessment Screening and Natura Impact Statement has been prepared by Altemar Ltd. and the report is presented in full in Appendix 3.

7.2 The conclusions of the Appropriate Assessment Screening are as follows;

An initial screening of the proposed works, using the precautionary principle (without the use of any mitigation measures) and Natura 2000 sites with the potential to result in significant effects on the conservation objectives and features of interest of the Natura 2000 sites was carried out in Table 10. Based on best scientific knowledge and objective information and assessment, the possibility of significant effects caused by the proposed project was excluded for the following Natura 2000 sites.

Special Protection Areas

Inishmore SPA (2.7 km from cable route corridor)
Lough Corrib SPA (5.1 km from cable route corridor)
Cregganna Marsh (6.3 km from cable route corridor)
Cliffs of Moher SPA (4.0 km from cable route corridor)
Connemara Bog Complex SPA (7.9 km from cable route corridor)
Slyne Head To Ardmore Point SPA (8.4 km from cable route corridor)

Special Areas of Conservation

Inishmore Island SAC (within the proposed survey route)
Black Head-Poulsallagh Complex SAC (1.9 km from cable route corridor)
Lough Corrib SAC (2.5 km from cable route corridor)
Inisheer Island SAC (3.1km from cable route corridor)
Inishmaan Island SAC (3.9 km from cable route corridor)
Connemara Bog Complex SAC (7.0 km from cable route corridor)
Moneen Mountain SAC (9.5 km from cable route corridor)
East Burren Complex SAC (10.1 km from cable route corridor)
Inagh River Estuary SAC (10.6km from cable route corridor)
Ballyvaughan Turlough SAC (10.7 km from cable route corridor)
Lough Fingall Complex SAC (10.9 km from cable route corridor)

Ballyteige (Clare) SAC (11.1 km from cable route corridor)
Lough Nageeron SAC (14.1 km from cable route corridor)
Kiltiernan Turlough SAC (14.1 km from cable route corridor)

The project is limited in scale and extent and the potential zone of influence is restricted to the immediate vicinity of the survey route, with the exception of underwater noise that may extend beyond the survey corridor. The proposed intertidal survey is within Inner Galway Bay SPA and Galway Bay Complex SAC. Subtidal elements of the project are within Galway Bay Complex SAC, Inner Galway Bay SPA and Inishmore Island SAC. However, the survey will not impact on the features of interest Inishmore Island SAC. In addition, although Kilkieran Bay and Islands SAC is 1.8 km from cable survey corridor, standard marine mammal mitigation measures are required (in compliance with NPWS guidance) and harbour seals from this SAC may be present within the survey corridor.

Acting on a strictly precautionary basis, NIS is required in respect of the effects of the project on the Inner Galway Bay SPA (potential disturbance to species and habitat impacts), Galway Bay Complex SAC (potential habitat and harbour seal impacts) and Kilkieran Bay and Islands SAC (potential harbour seal impacts) because it cannot be excluded on the basis of best objective scientific information following screening, in the absence of control or mitigation measures that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the named European Site/s.

An NIS or Stage 2 Appropriate Assessment is not required for the effects of the project on all other listed Natura sites above because it can be excluded on the basis of the best objective scientific information following screening that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the European Site/s.

Appendix 1 – Drawings.

FORESHORE LICENCE MAPS:

- 1334-A-103 Site Location Map
- 1334-A-104 Site Location Map 2
- 1334-A-101 Foreshore Licence Map 1
- 1334-A-102 Foreshore Licence Map 2

Appendix 2 – Marine Archaeology Assessment Report.

Appendix 3– AA SCREENING AND NATURA IMPACT STATEMENT