ALCATEL SUBMARINE NETWORK

Havhingsten

Appendix A - Environmental Assessment Methodology

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1. ENVIRONMENTAL ASSESSMENT METHODOLOGY

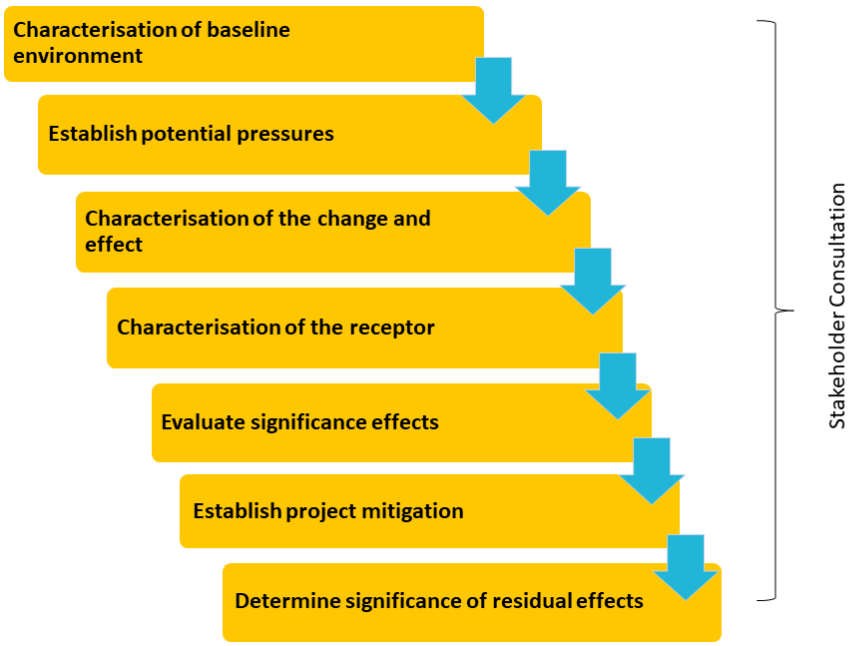
1.1 Introduction

The environmental assessment presented in this planning report assesses the environmental pressures associated with the licensable activities of the Havhingsten cable installation and summarises the findings and conclusions. Licensable activities include:

- Cable installation in Irish territorial waters (between MHWS and 12nm boundary); and
- Rock deposits in Irish territorial waters and the Irish EEZ.

1.2 Environmental assessment method

The assessment process will follow these main steps:



The steps are described in more detail below and are followed and presented in the receptor topic chapters of this planning report.

1.2.1 Characterisation of the baseline environment

To assess the potential effects resulting from the project, it is necessary to first establish the physical, biological, and socio-economic conditions that currently exist along and within the vicinity of the proposed marine cable route.

For each receptor, the baseline has been described from the Ireland/UK median line to the Loughshinny landing site.

The information contained in this planning report has been drawn from existing literature, project-specific documentation, personal communications with local experts, and site-specific surveys and studies commissioned by the project. Every effort has been made to obtain data concerning the

existing environment and to accurately predict the effect of the proposed development. Assumptions adopted in the evaluation of effects are reported in the relevant sections. Key literature sources included in this document are included at the beginning of each section. Several specialist studies and surveys have been carried out to gather environmental information for the project (provided in Appendices). More information on these and other information sources is given in the relevant sections of the planning report.

The data collected throughout these assessments and surveys have been used to define the baseline conditions. Potential effects of cable installation and maintenance activities have been assessed against the baseline provided. Embedded mitigation measures are contained within the project description and identified in Section 2. Effects have been measured and predicted, in turn helping to identify the project specific mitigation measures required.

1.2.2 Establish potential effects and the zone of influence

The IEMA (2004) guidelines state:

"The assessment stage of the EIA should follow a clear progression; from the characterisation of 'impact' to the assessment of the significance of the effects including the evaluation of the sensitivity and value of the receptors." (p11/2)

The IEMA (2016) guidelines encourage consideration of the potential effects at project design stage and the development of possible mitigation through stakeholder engagement.

In Ireland, The Department of Housing, Planning and Local Government provides Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessments. (EPA 2017). Irish authorities refer to effects rather than impacts.

For consistency, the terms pressure, interaction and effect, as defined in Table 1-1 below, have been used throughout the planning report.

Table 1-1 Definitions of pressure, interaction and effect

Term	Definition
Pressure	A pressure can be defined as "the mechanism through which an activity influences any part of the ecosystem". The nature of the pressure is determined by activity type, intensity and distribution. A list of marine pressures and their definitions has been formally agreed by the OSPAR Intercessional Correspondence Group on Cumulative Effects (ICG-C).
Interaction	The link between a pressure and the receptor. There must be an interaction for an impact to occur.
Effect	The consequence of pressures; a predicted change in the baseline environment, usually measurable. Effects only occur when an activity or environmental impact is present within an environment that is sensitive to it.

The prediction of potential effects has been undertaken to determine what could happen to each environmental receptor as a consequence of the project and its associated activities. The diverse range of potential effects considered in the environmental assessment process results in a range of prediction methods being used including quantitative, semi-qualitative and qualitative. Potential pressures to be assessed are provided in each receptor topic chapter.

For each potential pressure, the Zone of Influence (ZOI) – the spatial extent over which the activities are predicted to have an impact on the receiving environment – is established as the marine cable corridor and immediate surrounding area, except for habitat and species receptors considered in Table

5-1 of the Appropriate Assessment Screening Report. The ZOI will vary for different activities and for the different stages of the Project (installation and maintenance).

Establishing the ZOI for different activities, pressures and receptors will be undertaken quantitatively where possible, but if not, it will be undertaken qualitatively where necessary based on the project description, project experience and literature reviews.

Potential effects on receptors which occur outside the ZOI and which cannot or are unlikely to travel into the zone can be screened out. Conversely, mobile species and other mobile receptors such as other sea users can travel into the zone of influence and may therefore be impacted by the project.

The ZOI will in many cases relate to the seabed and or sea surface footprint of the project activities. However, in some cases the zone of influence may extend further e.g. suspended sediments may be transported several kilometres before resettling.

ZOI have been considered for each potential pressure on the receptor. Where several project activities result in the same pressure (e.g. pre-lay grapnel run or trenching, resulting in seabed disturbance) or the installation technique has not been determined, the worst-case zone of influence has been applied.

1.2.3 Characterisation of change and effect

The parameters used to define the magnitude of change or the Magnitude Value of the effect, are based on the definitions provided in Table 1-2.

Table 1-2 Factors which determine the magnitude of an effects

Term	Definition
High	Long term (> 5 years) and/or regional level loss or major alteration to key elements /features of the baseline condition such that post development character/composition of the baseline will be fundamentally changed.
Medium	Medium term (1- 5 years) loss and/or local level change (greater than the Project footprint) or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Short term (<1 year), site specific and/or a minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a “no change” situation.

1.2.4 Characterisation of the receptor

The significance of an effects on a receptor or feature is characterised by the sensitivity, recoverability and importance of the receptor or feature (Table 1-3). Characterisation of the receptor is achieved by balancing out these three considerations to determine the Receptors Value. Criteria used for the assessment are presented in Table 1-4.

Table 1-3 Definitions for characterising the receptor

Term	Definition
Sensitivity	The sensitivity of a receptor relates to its sensitivity/ vulnerability to change (including s capacity to accommodate change i.e. the tolerance/ intolerance of the receptor to change).
Spatial extent	The ability of the receptor to return to the baseline state before the project effects caused the change.
Duration and frequency	The importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within geographical context, whether it is important internationally, nationally or locally important.

Table 1-4 Criteria for characterising the sensitivity or value of the receptor

Receptor Value	Definition		
High	**Receptor has little or no ability to absorb change without fundamentally altering its character. For example:**		
	Physical	Biological	Socio-economic
	One or more combinations of: ▪ Receptor has low / no capacity to return to baseline condition within project life e.g. low tolerance to change and low recoverability such as a physical feature formed over a geological time scale. ▪ The receptor is a designated feature of a protected site or is rare or unique.	One or more combinations of: ▪ Receptor has low tolerance to change e.g. the species population is likely to be killed or destroyed by the project activity (MarLin 2016) ▪ Recovery to baseline conditions over a very long period i.e. > 10 year or not at all (MarLin 2010) ▪ The receptor is a designating feature of an International protected site e.g. OSPAR habitat or RAMSAR site. ▪ Receptor is very rare / unique / or ecologically important.	One or more combinations of: ▪ Receptor has low / no capacity to return to baseline e.g. low tolerance to change and low recoverability such as loss of access with no alternatives. ▪ Damage to asset(s) e.g. at cable crossing, resulting in major financial consequences for the company. ▪ Receptor is economically valuable.
Medium	**Receptor has moderate capacity to absorb change without significantly altering its character; however, some damage to the receptor will occur. For example:**		
	Physical	Biological	Socio-economic
	One or more combinations of: ▪ Receptor has intermediate tolerance to change. ▪ Medium capacity to return to baseline condition e.g. >5 of up to 10 years.	One or more combinations of: ▪ Receptor has intermediate tolerance to change e.g. some individuals of the species may be killed/destroyed by the project activity and the viability of a species population may be reduced (MarLin 2016) ▪ Recovery to baseline conditions over a long	One or more combinations of: ▪ Receptor has intermediate tolerance to change e.g. loss of access but acceptable alternatives, alteration to route but with no significant economic consequences. ▪ Damage to asset(s) e.g. at cable crossings, resulting in financial

Receptor Value	Definition		
	▪ The receptor is valued but not protected.	period i.e. > 5 or up to 10 years (MarLIN 2010). ▪ The receptor is designated as a national site e.g. NHA ▪ Uncommon or moderately valuable economically or ecologically but not rare or unique.	consequences for the company.
Low	**The receptor is tolerant to change without significant detriment to its character. Some minor damage to the receptor may occur. For example:**		
	Physical	Biological	Socio-economic
	One or more combinations of: ▪ Noticeable but short-term, localised change in baseline condition e.g. within environmental quality standards or regulatory compliance levels, disturbance to seabed sediments, seabed features, geomorphological features, coastal processes or quality change within zone of influence. ▪ High capacity to return to baseline condition e.g. <1 year ▪ The receptor is common and/or widespread.	One or more combinations of: ▪ Localised or short-term damage / disturbance to portion of the population / habitat ▪ Recovery to baseline conditions within 1 year ▪ The receptor is neither rare, unique or of significance in terms of economic or ecological value.	One or more combinations of: ▪ May affect behaviour but is not a nuisance to users. ▪ Minor / no financial consequence to the company.
Negligible	The receptor is tolerant to change with no effect on its character. The project activity does not have a detectable effect on survival or viability of a species (MarLin 2016). The habitat or species is expected to recover rapidly i.e. within a week (MarLin 2010)		

1.2.5 Evaluation of significance of effect

Having established the magnitude of change (magnitude value), the sensitivity of the receptor (receptor value) and the embedded mitigation measures, the significance of the effect can be assessed using the significance matrix adapted from typical classifications of significance of effects (EPA 2017) (Table 1-5).

Table 1-5 Significance matrix

		Magnitude of change			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of receptor (Receptor value)	**High**	Not Significant	**Moderate**	Significant	Very Significant / Profound
	Medium	Not Significant	Slight	Moderate	Significant
	Low	Imperceptible	Slight	Slight	Moderate
	Negligible	Imperceptible	Not Significant	Not Significant	Slight

The result of using this matrix approach is the assignment of the level of significance of the effect for all project potential effects. This is done prior to any project specific mitigation being applied. Definitions of the significance levels (as defined in EPA 2017) are provided in Table 1-6 below.

Table 1-6 Definitions of significance levels

Significance	Definition	
Imperceptible	An effect capable of measurement but without significant consequences.	Effects in these three categories are generally considered as **Not Significant** and adequately controlled by best practice and legal controls. Opportunities to reduce effects further through mitigation may be limited and are unlikely to be cost effective.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.	
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.	Effects in this category are those people are prepared to tolerate i.e. they are **Tolerable**. However, it is expected that the residual effect has or will be subject to feasible and cost-effective mitigation and has been reduced to as low as reasonably practicable (ALARP) and that no further measures are feasible.
Significant	Generally regarded as unacceptable prior to any mitigation measures being considered.	Generally considered as **Significant** and regarded as unacceptable prior to any mitigation measures being considered.
Very significant /	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment	
Profound	An effect which obliterates sensitive characteristics	

1.2.6 Establishment of mitigation

Mitigation measures are the actions or systems proposed to manage or reduce the potential negative effects identified. Mitigation measures are sometimes confused with measures taken to ensure legal compliance, which can be similar. Legislation is often designed to ensure effects to the environment are minimised.

A standard hierarchical approach to identifying mitigation requirements has been used to inform the environmental assessment:

- **Avoid or Prevent**: In the first instance, mitigation should seek to avoid or prevent the adverse effect at source for example, by routeing the marine cables away from a sensitive receptor.
- **Reduce**: If the effect is unavoidable, mitigation measures should be implemented which seek to reduce the significance of the effect.
- **Offse**t: If the effect can neither be avoided nor reduced, mitigation should seek to offset the effect through the implementation of compensatory mitigation.

Mitigation measures fall into two categories: mitigation which forms part of the project design which is referred to as embedded mitigation; and mitigation which is part of the construction and operation of the project, which is referred to as project specific mitigation.

1.2.7 Embedded mitigation

As described in Section 3 of the Planning Report, the Project has been developed through an iterative process which involved seeking to avoid or reduce potential environmental effects through routing of the marine cable. This was the first project specific step in mitigating potential effects by seeking to avoid or reduce environmental disturbance.

Embedded mitigation measures which form part of the design are an inherent part of the project and are considered the 'base case'. As well as steps the project has taken to reduce environmental effects, the base case also includes measures taken to ensure compliance with international and national statute and appropriate guidance, which also seeks to avoid or abate negative effects.

All embedded mitigation which has been assessed as part of the 'base case' is listed in the Section 2.11 of the Planning Report and the appropriate receptor topic section.

1.2.8 Project specific mitigation

Mitigation measures which are to be adopted and implemented during the construction and operation of the project to mitigate adverse effects, over and above legal compliance are called Project Specific Mitigation. Appropriate, feasible and cost-effective mitigation measures have been proposed as necessary in each topic section. All project specific mitigation commitments made in the environmental assessment are listed in Section 6.

1.2.9 Determine significance of residual effect

The significance assessment is repeated taking into consideration the application of Project specific mitigation. This determines whether there is likely to be a residual effects. When applied after mitigation, the resulting significance level is referred to as the residual significant effect. Tables within the topic chapters present the results of both assessments.

Residual effects assessed as moderate or major after consideration of proposed mitigation measures will normally require additional analysis and consultation to discuss and possibly further mitigate effects where possible. Where further mitigation is not possible a residual effect may remain.

1.2.10 Cumulative effects assessment

The environmental assessment will assess cumulative and indirect effects and interactions for licensable activities.

For the purposes of the assessment, the definitions proposed by the European Commission (1999) will be used. The definitions are as follows:

- Indirect Effects (secondary effects) – Effects on the environment, which are not a direct result of the project, often produced away from or because of a complex pathway.

- Cumulative Effects – Effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.
- Impact Interactions – The reactions between effects whether between the effects of just one project or between the effects of other projects in the area.

The assessment of cumulative effects will consider other projects that have been granted development consent. In-combination effects is a term used specifically in relation to the EU Habitats Regulation Appraisal which requires effects of a project to be assessed alone and 'in-combination' with other plans or projects. The in-combination effect is included in the Appropriate Assessment Screening Report for the project.

Following an assessment of the baseline and the potential environmental pressures from licensable activities individually, other projects in the area at the time of the assessment will be reviewed.

2. REFERENCES

1 Guidelines on the information to be contained in environmental impact assessment reports. Draft August 2017