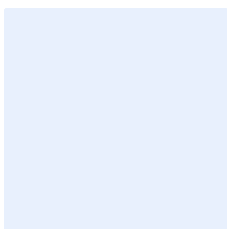


Supporting Information for Derogation Licence Allód Energy Ltd.



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Allód Energy Ltd.

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1 INTRODUCTION

1.1 OBJECTIVE

This supporting information forms part of an application for a Regulation 54 derogation application to undertake geophysical marine site investigation activities, with the objective of assessing an area in the Celtic Sea for potential hydrogen storage. The proposed investigations will define the extent and internal character of halite rock beneath the seafloor, to assess and de-risk potential suitability for hydrogen storage development in halite.

This derogation application has been prepared by GDG on behalf of Allód Energy Ltd. A Maritime Usage Licence (MUL) Application for the proposed investigations is under consideration by MARA and this derogation application is also supported by information and reports associated with the MUL Application, including:

- Assessment of Impact of the Maritime Usage (AIMU) report (Appendix A)
- Risk Assessment for Annex IV Species (RAAIVS) (Appendix B)

1.2 STATEMENT OF AUTHORITY

This report has been prepared by Charlotte Manwaring (BSc. Hons Geological Science, MSc. Geochemistry). Charlotte is a Senior Environmental Scientist with extensive experience (20+ years) as an environmental consultant, undertaking various multi-disciplinary projects within consulting engineering.

This report has been reviewed and approved by Joey O'Connor, Principal Marine Environmental Scientist at GDG, specialising in Environmental Impact Assessment and Appropriate Assessment. Joey holds an MSc in Engineering in the Coastal Environment from the University of Southampton and a BSc (Hons) in Marine Science from the University of Galway. He has 17 years' experience as a marine and coastal environmental professional across the public and private sectors, including 10+ years' project and team management experience. Joey has delivered and overseen numerous environmental assessments and consents for infrastructure projects, including ports and offshore and onshore windfarms, and has extensive experience in offshore survey, Marine Protected Area monitoring, and regulatory advisory roles, including as a statutory adviser to the UK government and devolved administrations with the Joint Nature Conservation Committee (JNCC).

2 BACKGROUND

The surveys will assess the extent and internal character of halite rock beneath the seabed to de-risk any future hydrogen storage development, supporting Ireland's Climate Action Plan and National Hydrogen Strategy objectives and our transition to alternative fuels and net-zero commitments. Allód will undertake both 2D and 3D surveys. A Maritime Usage Licence (MUL) for 7-year licence is also being sought, however it is anticipated that actual survey duration will be 20 days, excluding any weather delays or operational downtime.

The majority of activities proposed will consist of towed geophysical survey equipment. Bottom contacting activities will occur only with Ocean Bottom Node (OBN) equipment deployment, if deployed.

2.1 LOCATION OF LICENCE AREA

The Licence Area covers a total area of 1,481 km² and is outlined below (Figure 2-1). Note all proposed licensable activities will be conducted within the Licence Area below.

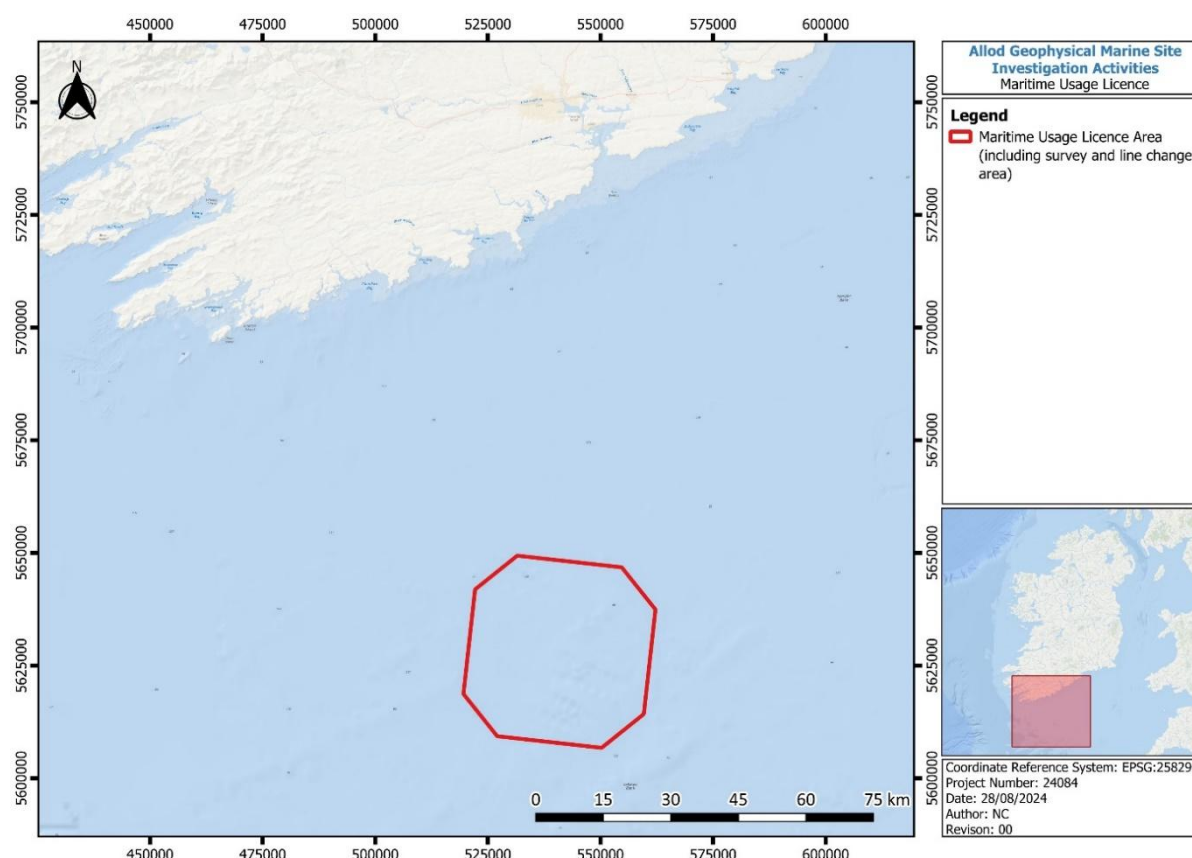


Figure 2-1: Site Location. The redline indicates the proposed survey area

2.2 NEED FOR THE PROPOSED ACTIVITY

The proposed marine site investigation (SI) activities are required to determine the suitability of the seafloor and subsurface geological conditions within the Licence Area for the potential geological storage of hydrogen. Allód Energy Ltd. has undertaken an extensive desktop study using existing offshore geological information published by the Geological Survey of Ireland, which confirms that salt formations suitable for cavern storage are limited in extent offshore Ireland. The Licence Area represents one of the few locations where halite has been proven to exist, warranting further, up-to-date geophysical investigation.

Geological storage of hydrogen is a critical enabling technology for the delivery of Ireland's decarbonisation objectives, as set out in the Climate Action Plan, the National Hydrogen Strategy and the National Marine Planning Framework. While the proposed development does not constitute an offshore renewable energy project as defined under the Designated Maritime Area Plan (DMAP) process, it represents essential supporting infrastructure for offshore renewable energy (ORE) deployment. As with other strategic energy infrastructure (including ports, electricity interconnectors and energy parks), large-scale hydrogen storage will be required to support the integration of increasing volumes of renewable electricity into the energy system.

A significant proportion of forthcoming offshore renewable energy projects are expected to operate without direct grid connection, necessitating alternative offtake solutions. These are anticipated to comprise a combination of green hydrogen production and/or storage, private wire connections, energy parks and hybrid interconnection arrangements. Geological hydrogen storage provides a means of addressing the inherent intermittency and seasonality associated with renewable energy generation, supporting security of supply and system flexibility.

The existing geological datasets available for the Licence Area consist primarily of legacy two-dimensional seismic surveys that are of limited spatial coverage, uncertain positional accuracy and insufficient resolution to inform project design or progression. While these data have been used to define the broad study area and inform the scope of proposed investigations, they do not provide the level of confidence required to assess subsurface structure, halite extent or cavern suitability. Accordingly, the proposed geophysical investigations are required to acquire accurate, modern datasets to enable an informed assessment of the feasibility of future hydrogen storage development.

The geophysical surveys are required to acquire modern, high-resolution subsurface data; alternative methodologies and technologies that would achieve the same objective without the use of acoustic geophysical methods as yet do not exist.

Under a do-nothing scenario, the proposed SI activities would not proceed and no new geophysical data would be acquired within the Licence Area. The project would therefore not be able to proceed and the potential overriding public interest objectives could not be met – such as national and EU climate and decarbonisation objectives.

2.3 LEGISLATION AND GUIDANCE

Article 16 of the Habitats Directive provides for derogations from the strict protection provisions set out in Articles 12 and 13. Such derogations may only be granted in strictly limited circumstances, where it can be demonstrated that a series of stringent and cumulative tests are satisfied. Article 16 is transposed into Irish law through Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011.

An application for a Regulation 54 derogation may arise where an applicant proposes to undertake a specific activity and cannot avoid committing one or more offences under Article 12. Any derogation application must clearly identify the specific prohibited activity or activities for which consent is sought. Where granted, the authorised prohibited activity or activities will be explicitly stated within the derogation licence.

Before granting a derogation, the National Parks and Wildlife Service (NPWS) applies the following three cumulative tests, which are assessed sequentially:

- Test 1: The derogation must be required for one or more of the reasons specified under Regulation 54(2)(a)–(e)
- Test 2: There must be no satisfactory alternative to the proposed activity; and
- Test 3: The derogation must not be detrimental to the maintenance of the populations of the species concerned at Favourable Conservation Status (FCS) within their natural range.

Each test must be satisfied in turn. Where an application fails Test 1, it is not considered further and must be refused. Likewise, failure to satisfy Test 2 precludes consideration of Test 3. A derogation may only be granted where all three tests are met.

All species of cetacean (whales, dolphins and porpoises) occurring in European Union (EU) waters are considered European Protected Species (EPS) under Annex IV of the Habitats Directive (Council Directive 92/43/EEC). As directed by Article 12 of the Directive, species listed in Annex IV are considered species of community interest in need of strict protection across their entire natural range within the EU, both within and outside Natura 2000 sites. In addition to cetaceans, other EPS occurring in Irish waters are the Eurasian otter (*Lutra lutra*) and the leatherback turtle (*Dermochelys coriacea*).

The regulations provide for the strict protection of Annex IV listed species, in their natural range. As such, it is an offence to:

- a) Deliberately capture or kill any specimen of these species in the wild
- b) Deliberately disturb these species particularly during the period of breeding, rearing, hibernation and migration
- c) Deliberately take or destroys eggs of those species from the wild
- d) Damage or destroy a breeding site or resting place of such an animal or

- e) Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive.

Article 12(1)(a)–(c) of the Habitats Directive prohibits the deliberate capture or killing of protected species, deliberate disturbance, and the deliberate destruction or taking of eggs from the wild. The interpretation of the term “deliberate” must be read in light of relevant Court of Justice of the European Union (CJEU) case law, in particular Cases C-103/00 and C-221/04

An action is considered deliberate where a person or body knows, or should reasonably have known, that their activity is likely to result in an offence against a protected species, and nevertheless proceeds by consciously accepting the foreseeable consequences. This includes actions not intended to harm protected species but undertaken with awareness of the associated risk.

Principle of Proportionality

Whilst derogations may only be granted subject to meeting stringent legal requirements, European Commission guidance emphasises that the principle of proportionality should be applied when assessing compliance with each of the Article 16 tests. As stated in Commission guidance, “as a general rule, the severity of any of the conditions or ‘tests’ will increase with the severity of the potential impact of a derogation on a species or population.”

Accordingly, derogation applications are assessed on a case-by-case basis, with the level of justification, assessment detail and mitigation required being proportionate to the scale, duration and potential significance of the predicted impacts on the species concerned.

Precautionary Principle

Article 191(2) of the Treaty on the Functioning of the European Union establishes the precautionary principle as a core component of EU environmental policy. This principle applies where there is a risk of environmental harm and scientific uncertainty exists regarding the magnitude, likelihood or reversibility of potential effects.

In this context, applicants are required to provide sufficient, relevant, and up-to-date scientific information to allow the competent authority to evaluate risks objectively and to determine whether proposed mitigation measures are adequate to prevent or minimise adverse effects on protected species. Where uncertainty remains, a precautionary approach is adopted in the assessment of potential impacts and compliance with the derogation tests.

3 PROPOSED ACTIVITY

The proposed marine geophysical site investigation will be undertaken using a suite of established seismic and non-seismic survey technologies to characterise subsurface geological conditions within the survey area (Figure 2-1). The core seismic configuration will comprise a towed airgun array (approximately 15 m × 15 m, comprising c. 40 small airguns with a combined volume of c. 4,500 cubic inches), together with up to ten towed streamers, each approximately 8 km in length and spaced at 100 m intervals, incorporating over 10,000 hydrophones. Where required, up to 500 ocean bottom nodes (OBNs) may be deployed on the seabed using a remotely operated vehicle (ROV) to supplement data acquisition. Additional survey equipment will include multibeam echosounders (MBES), sub-bottom profiling systems (boomer, sparker and parametric pinger), side scan sonar (SSS), ultra-short baseline (USBL) positioning systems and a magnetometer. All equipment will be deployed temporarily for the duration of the survey campaign only, with no installation of permanent infrastructure.

The proposed survey will involve the following equipment:

- 15m x 15m array of approximately 40 small airguns with a combined volumetric capacity of c. 4500 cubic inches (cu.in.)
- 10 streamers (each 8km in length, spaced 100m apart, giving a total width of 1km and total length of 8km)
 - Over 10,000 hydrophones encased within the streamers
- Ocean Bottom Nodes (OBN's) at up to 500 locations on the seabed (if deployed)
 - Placed on the seabed using a Remotely Operated Vehicle (ROV)
 - Remain on the seabed whilst the survey vessel sails a predetermined survey pattern.
 - Retrieved from the seabed using a Remotely Operated Vehicle (ROV)
- Multibeam Echosounders (MBES).
- Ultra-Short Baseline (USBL).
- Sub-Bottom Profiling (Boomer, Sparker, Parametric Pinger).
- Side Scan Sonar (SSS).
- Magnetometer.

Detailed information is included in Table 3-1, **Appendix A AIMU** and **Appendix B RAAIVS**.

Table 3-1: Proposed Programme of Site Investigations

Survey Type	Equipment Type	Purpose	Sampling Effort
Ancillary	Remote Operated Vehicle (ROV)	An ROV will be used to deploy and recover the Ocean Bottom Nodes (OBNs) to and from the seabed.	OBNs may be deployed by ROV at up to 500 locations across the Maritime Usage Licence Area.
	Ultra-short baseline (USBL)	USBL is a tracking system for in-water equipment and consists of a transceiver on the survey vessel and a transponder on the subsea equipment to be tracked.	The USBL may be used across the Maritime Usage Licence Area to track the position of subsea equipment.
	Airgun Array (2000 psi, 4500 in ³)	An airgun array is used to emit low-frequency sounds in a downward direction, to image the geological structure of the below seabed.	The airgun array survey may be undertaken across the full extent of the Maritime Usage Licence Area.
Geophysical	Ocean Bottom Nodes	OBN's are autonomous recording nodes which are placed on the seafloor using ROV's.	OBNs may be deployed by ROV at up to 500 locations across the Maritime Usage Licence Area. Each OBN has dimensions of 200x155x70mm and has a weight of 2.5kg in seawater.
	Magnetometer	A magnetometer is used to identify magnetic anomalies and hazard mapping for metal obstructions, shipwrecks and unexploded ordnance on the surface and in the shallow sub-surface. The Geometrics G-882 can be taken as an indicative equipment example, it is a passive device (i.e. it does not emit any sound waves into the marine environment).	Magnetometer survey may be undertaken across the Maritime Usage Licence Area to a suitable coverage.
	Sub-bottom Profiling (SBP) - Boomer	SBP is used to develop an image of the subsurface, identifying different strata encountered in the shallow sediments.	SBP may be undertaken across the Maritime Usage Licence Area to a suitable coverage.
	Sub-bottom Profiling (SBP) - Parametric Pinger	SBP is used to develop an image of the subsurface, identifying different strata encountered in the shallow sediments.	SBP may be undertaken across the Maritime Usage Licence Area to a suitable coverage.
	Sub-bottom Profiling (SBP) – Sparker	SBP is used to develop an image of the subsurface, identifying different strata encountered in the shallow sediments.	SBP may be undertaken across the Licence Application Area to a suitable coverage.

Survey Type	Equipment Type	Purpose	Sampling Effort
	Multibeam Echosounder (MBES)	MBES is a system for collecting detailed topographical data of the seabed.	MBES may be undertaken across the Maritime Usage Licence Area to a suitable percentage coverage.

4 ECOLOGICAL SURVEY & ASSESSMENT

As part of the MUL application a Risk Assessment for Annex IV Species was undertaken and included in **Appendix B**. A summary is included here.

The RAAIVS was undertaken in accordance with Article 12 of the EU Habitats Directive (92/43/EEC), as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), and with reference to national guidance, including *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* (DAHG, 2014). The assessment considers whether the proposed activity could result in deliberate disturbance, injury or mortality of Annex IV species, or otherwise undermine the system of strict protection, thereby necessitating a derogation under Article 16 of the Directive.

The assessment focuses on Annex IV species known to occur, or with the potential to occur, within the proposed MUL area, including cetaceans (whales, dolphins and porpoises) and marine turtles (leatherback and loggerhead turtle). Other Annex IV species, such as otter and bats, were screened out due to the absence of a plausible source–pathway–receptor linkage, given the offshore location and water depths of the survey area.

Potential impact pathways associated with the proposed site investigation activities were identified as:

- underwater noise from seismic and other geophysical survey equipment;
- injury or mortality risk arising from vessel collision;
- injury or mortality risk arising from entanglement with towed survey equipment; and
- pollution risk associated with vessel operations.

Underwater noise was identified as the primary potential risk pathway, particularly from the use of airgun arrays and associated survey equipment. The assessment considers the potential for behavioural disturbance, temporary or permanent auditory injury, and displacement effects on relevant Annex IV species. Collision and entanglement risks were assessed as secondary pathways, taking account of vessel type, number, speed, operational patterns and the highly mobile nature of the receiving species. Pollution risk was also assessed and considered to be low, given compliance with MARPOL requirements and standard industry operating procedures.

A comprehensive suite of mitigation measures is proposed, consistent with Irish and international best practice. These include the deployment of qualified Marine Mammal Observers (MMOs) and Passive Acoustic Monitoring (PAM), pre-start monitoring, establishment of a 1,000 m mitigation zone, soft-start (ramp-up) procedures for seismic equipment, restrictions on vessel speed (typically ≤5 knots during survey operations), and defined procedures for line changes, airgun testing and survey breaks. Monitoring and reporting commitments are included to ensure transparency and compliance.

With the implementation of these mitigation measures, the assessment concludes that the proposed site investigation activities are highly unlikely to result in injury, mortality or significant disturbance

to Annex IV species, will not adversely affect the favourable conservation status of any such species within their natural range, and will not constitute an offence under Article 12 of the Habitats Directive. Any disturbance that may occur is predicted to be localised, temporary and reversible, with affected species expected to return to baseline behaviour following completion of the surveys.

On this basis, the RAAIVS concludes that the proposed geophysical marine site investigation activities do not undermine the system of strict protection for Annex IV species. However, as described in the Derogation Tests below (Section 5), the “precautionary principle” is applied in seeking this derogation.

5 DEROGATION TESTS

5.1 TEST 1 REASON FOR DEROGATION

The reason for the derogation application under Regulation 54(2)(a-e) or Regulation 54A(2)(a-e) of the European Communities (Birds and Natural Habitats) Regulations, for the proposed SI is as follows:

- c). In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment

Marine geophysical site investigations are proposed within the area of the Celtic Sea with the objective of assessing the potential suitability of subsurface halite formations for hydrogen storage. The investigations are designed to define the depth, lateral extent and internal geological character of halite rock beneath the seabed, in order to assess and de-risk the feasibility of potential future hydrogen storage development.

In accordance with Part D of the NPWS derogation tests, the proposed surveys are required for reasons of overriding public interest, including those of a social and economic nature, and are expected to facilitate beneficial consequences of primary importance for the environment. In particular, the investigations support:

- the advancement of low-carbon energy infrastructure and long-duration energy storage solutions critical to national and EU climate and decarbonisation objectives;
- enhanced energy security and system resilience, which are matters of public safety and public interest;
- environmentally responsible planning by enabling the early identification of suitable geological conditions, thereby reducing the risk of adverse environmental effects during any future development phases.

5.2 TEST 2 ABSENCE OF ALTERNATIVE SOLUTIONS

Test 2 involves determining whether there is a satisfactory alternative to the derogation i.e. whether the problem the applicant faces, or the objective of the activity, can be solved or met in a way that does not involve a derogation.

The objective of the proposed investigations is to acquire high-resolution, up-to-date geophysical data to characterise the extent, depth and internal structure of halite formations beneath the seabed, in order to assess the feasibility of potential geological hydrogen storage. This objective cannot be met without the acquisition of seismic survey data.

The following alternatives have been considered:

Do-nothing alternative

Under a do-nothing scenario, no new seismic data would be acquired and uncertainty regarding subsurface conditions would remain. This would preclude any robust assessment of hydrogen storage feasibility and would prevent progression of the overall project. The do-nothing option therefore does not meet the stated purpose of the activity and cannot be considered a satisfactory alternative.

Use of existing datasets only

Available legacy seismic and geological datasets for the Licence Area are limited in spatial coverage, positional accuracy and resolution. These datasets are insufficient to characterise halite geometry, continuity and cavern suitability to the standard required for feasibility assessment or environmentally responsible future planning. Reliance on existing data alone would not meet the objective of the proposed activity.

Alternative survey locations

The Licence Area has been selected based on the presence of offshore halite formations, as identified through published Geological Survey of Ireland data. Suitable halite formations are highly constrained in extent offshore Ireland, and there are no alternative locations available that would enable the same objective to be achieved without similar survey activities.

Alternative survey methods / technologies

The objective of imaging halite at approximately 1,000m below the seabed requires this particular method of geophysical surveying technique, no alternatives are available. The survey will however also acquire data relating to the seabed and near-seabed thus reducing potential additional surveys in the future. The surveying methodology has thus already considered and implemented methods to reduce cumulative effects of potential future surveys

Non-acoustic or lower-resolution survey techniques would not provide the depth penetration or data quality required to characterise subsurface halite structures. The proposed suite of geophysical methods represents established industry best practice for achieving the stated scientific and engineering objectives, and no alternative methodology would avoid the potential for disturbance while still meeting project requirements.

Alternative timing

The surveys are short-term and will be undertaken in accordance with best practice mitigation measures to minimise environmental risk. Altering survey timing would not remove the need for acoustic data acquisition and would not eliminate the potential interaction with Annex IV species.

The proposed survey activities require wave heights below 2 meters for safety of personnel and protection of equipment as there will be towed equipment in the water. Survey operations are thus required within a window from April to September. Operations outside this window are not practical or safe.

Having considered all reasonable alternatives, it is concluded that there is no satisfactory alternative that would achieve the objective of the proposed activity without the potential for disturbance to Annex IV species. The proposed approach represents the least-risk, proportionate and

environmentally responsible means of obtaining the required information, with impacts minimised through robust mitigation and monitoring measures.

Accordingly, Test 2 is satisfied.

5.3 TEST 3 IMPACT OF DEROGATION ON CONSERVATION STATUS

Test 3 requires consideration of whether the proposed derogation would be detrimental to the maintenance of the populations of the species concerned at favourable conservation status (FCS) within their natural range, taking account of the scale of impact, the conservation status of the species, and the effectiveness of mitigation measures.

Nature and scale of potential impacts

The proposed site investigation activities may result in short-term, localised disturbance to a small number of Annex IV marine mammal species and marine turtles, primarily as a result of underwater noise generated by geophysical survey equipment. No mortality, physical injury, habitat loss, destruction of breeding or resting sites, or long-term displacement is predicted.

Any disturbance effects are expected to be temporary, spatially limited to the immediate vicinity of the survey operations and fully reversible. The surveys are short in duration, and the wider marine environment will remain continuously available to Annex IV species throughout the survey period.

Population-level considerations

All Annex IV species considered are highly mobile, with large foraging ranges and broad migratory movements at the regional and transboundary scale. Temporary local avoidance of the survey area by individual animals would not affect population size, distribution, survival, reproductive success or long-term population viability.

There are no known breeding, calving, resting or other sensitive life-cycle areas for Annex IV species within the survey area during the proposed survey period. As such, there is no risk of impacts occurring at biologically sensitive times that could affect population recruitment or structure.

Mitigation measures and their effectiveness

A comprehensive suite of mitigation measures will be implemented which have been identified following undertaking of a Risk Assessment informed by the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (DAHG, 2014) and established international best practice. These measures include, but are not limited to:

- qualified Marine Mammal Observers (MMOs)
- pre-start monitoring periods
- establishment of a 1,000 m mitigation zone
- soft-start (ramp-up) procedures for all relevant acoustic sources
- intermittent shutdown and re-start protocols during survey breaks and line changes and
- speed management and operational controls to reduce collision risk.

These measures are well-established and have been demonstrated to substantially reduce the risk of auditory injury and to limit disturbance effects to minor, short-term behavioural responses, with animals typically returning to baseline behaviour following cessation of activity.

Conclusion on favourable conservation status

With the implementation of the proposed mitigation and monitoring measures, the site investigation activities will not result in:

- a reduction in population size or density
- a contraction of species range
- impairment of reproduction or recruitment or
- degradation of essential ecological functions required to maintain populations in the long term.

Accordingly, the proposed derogation will not be detrimental to the maintenance of Annex IV species at favourable conservation status within their natural range. Any disturbance that may occur will be proportionate, temporary and reversible, and will not undermine the system of strict protection established under Article 12 of the Habitats Directive.

This derogation licence application is therefore made with due consideration of the “Precautionary Principle”.

6 MONITORING

The Risk Assessment for Annex IV Species (Appendix B) identifies mitigation, monitoring and reporting measures.

A suite of mitigation measures is required to avoid injury and, where avoidance is not possible, to reduce the risk of disturbance associated with noise-emitting survey activities.

All mitigation measures will be implemented in accordance with the DAHG (2014) 'Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters. These measures will be embedded within the standard operating procedures for all relevant survey activities.

6.1 MARINE MAMMAL MONITORING

A qualified and experienced Marine Mammal Observer (MMO) will be appointed to monitor for marine mammals and to log all relevant events using standardised data forms provided by the DAHG (2014). In addition to this, a Passive Acoustic Monitoring (PAM) Operator will be used as a complementary measure in order to optimise marine mammal detection around the study site. Therefore, continuous visual and passive acoustic monitoring will be conducted during daylight hours to monitor for the presence of marine mammals. In the case where survey activities will continue into hours of darkness, PAM will continue to be used. In the event of initiation of acoustic input into the marine environment, and any species are detected within the relevant mitigation zone, a delay in the commencement of acoustic input will be implemented (see below).

6.2 PRE-START MONITORING

Marine mammal monitoring will be conducted for a pre soft-start search of at least 30 minutes i.e. prior to the commencement of marine operations which may impact detrimentally upon marine mammals. This will involve both a dedicated visual observation (required under DHAG 2014) and acoustic monitoring (complementary measure) to determine if any marine mammals are within the relevant zone of mitigation.

6.3 MITIGATION ZONE

For geophysical acoustic surveys the radial distance of 1,000m from the sound source intended for use is designated as the mitigation zone (DAHG 2014).

6.4 SOFT START

A soft start is the gradual ramping of power over a set period of time, to give any Annex IV species adequate time to leave the area. A soft start (or Ramp-up Procedure) must also be used during the testing of any seismic sound sources (DAHG, 2014).

If marine mammals are detected within the mitigation zone prior to soft start commencement, the soft start must be delayed until their passage, or the transit of the vessel, results in them being

outside of the mitigation zone. A minimum delay of 30 minutes is required between the last detection within the mitigation zone and the start of the soft start. This delay allows animals that were not detected (i.e., those that did not resurface within that time) to move outside of the mitigation zone.

Once the soft start commences, there is no requirement to halt or discontinue the procedure at night-time, if weather or visibility conditions deteriorate, or if Annex IV marine mammal species enter the mitigation zone.

In commencing a seismic survey operation, including any testing of seismic sound sources, where the output peak sound pressure level exceeds 170 dB re: 1µPa @1m, the following ramp up procedure will be undertaken in line with the DAHG (2014) guidance¹:

- a) Energy output will commence from a low energy start-up (e.g. increasing the number of airguns starting with the smallest airgun in the array or increasing the airgun pressure) and be allowed to gradually build up to the necessary maximum output over a period of 40 minutes. A 'soft start' (from commencement of soft start to commencement of the line) should take no longer than 40 minutes.
- b) This controlled build-up of energy output will occur in consistent stages to provide a steady and gradual increase over the ramp-up period.
- c) If marine mammals enter or are detected within the mitigation zone while the ramp-up procedure is under way but incomplete, the energy output will not be increased until the marine mammals are no longer within the mitigation zone.

6.5 LINE CHANGES

Seismic data is typically collected along predetermined survey lines. "Line change" or "line turn" refers to the process of turning the vessel at the end of one survey line prior to commencement of the next.

Where the duration of a survey line/station change is greater than 40 minutes, the following procedures will be undertaken:

- The sound source activity will, on completion of the line/station being surveyed, be terminated or, if acceptable under the guidelines at the time of acquisition, undergo a reduction in energy output.
- If terminated, prior to the start of the next line/station, all pre-survey monitoring measures and soft start procedures will be followed as for start-up.

Where the duration of a survey line/station change is less than 40 minutes the activity will continue as normal.

¹ Where the acoustic output measures outlined in steps (a) and (b) are not possible according to the operational parameters of any such equipment, Allód undertake to ensure the device shall be switched "on" and "off" in a consistent sequential manner over a period of 40 minutes prior to commencement of the full necessary output.

6.6 AIRGUN TESTING

Airgun tests may be necessary to trial new equipment or to evaluate repaired or misfiring airguns. Such tests can involve one or more airguns and may be conducted at different power levels. Where feasible, airgun testing will be incorporated into the soft start procedure and conducted before the start of a survey line to reduce the total amount of noise being introduced into the marine environment.

If testing of seismic devices including airguns cannot be integrated into a soft start procedure, a dedicated soft start must be implemented before testing any seismic sound sources (DAGH, 2014).

6.7 BREAKS IN THE SURVEY PERIODS

If there is a break in sound output from survey equipment for a period greater than 10 minutes (e.g., due to equipment failure, shut-down, survey line/station change) then all pre-start monitoring measures and ramp-up procedures will recommence prior to re-starting.

Unplanned breaks of less than 10 minutes will not require a soft start and firing can recommence at the same power level as at prior to the break (or lower), provided no marine mammals have been detected in the mitigation zone during the breakdown period. When marine mammals are detected within the Monitored Zone during such a break of greater than 10 minutes, the MMO operator will advise delaying recommencement of activities.

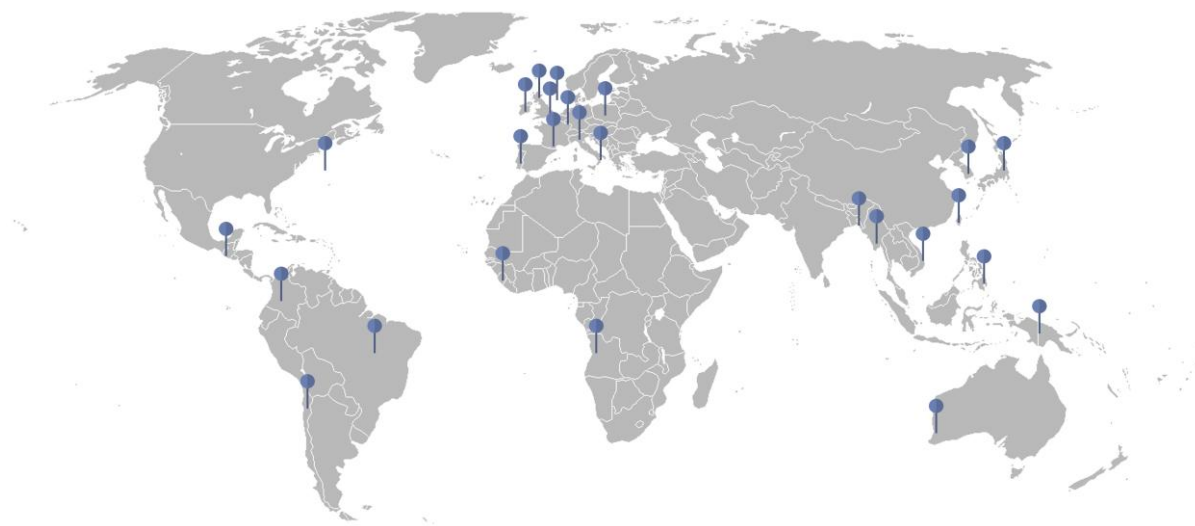
6.8 REPORTING

All recordings of Annex IV marine mammal species will be made using standardised data forms provided by the NPWS. Full reporting on operations and mitigation will be provided to the NPWS to facilitate reporting under Article 17 of the EC Habitats Directive and future improvements to guidance (DAHG, 2014). The report will also include feedback on how successful the measures were. This requirement will be communicated to the MMOs at project start up meetings and at crew change.

APPENDIX A – ASSESSMENT OF IMPACTS FOR MARITIME USAGE (AIMU)

APPENDIX B RISK ASSESSMENT FOR ANNEX IV SPECIES (RAAIVS)

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