

TECHNICAL APPENDIX 5.7



**Orkney Logistics Base (Hatston)
Marine Mammal Protection Plan**

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CONTROL SHEET

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1 MARINE MAMMAL MITIGATION PLAN

The marine mammal mitigation will comprise two protocols depending on the timings of the works carried out; A standard MMO protocol as per JNCC guidance which will be implemented during blasting operations in optimal sea states and during times of optimal visibility, and an Acoustic Deterrent Device (ADD) protocol which will be implemented during hours of low visibility and when the sea state exceeds 2.

1.1 Marine Mammal Observation Protocol – Blasting

The Marine Mammal Observation Protocol (MMOP) will be implemented so that the blasting works do not cause injury or unnecessary disturbance to marine mammals. This section has been designed with reference to current JNCC guidance ‘Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from explosives’ (August 2010) ¹.

1.1.1 Marine Mammal Observer

A suitably qualified Marine Mammal Observer (MMO), competent in the identification of marine mammals at sea, will be present prior to and during any blasting. The MMO will undertake observation for marine mammals within the mitigation zone before and during vibratory piling and blasting and will be dedicated to that one task for the duration of any watch. The MMO will advise the contractors and crews on the implementation of the procedures set out in the agreed protocol, to ensure compliance with those procedures.

The JNCC guidance provides the following definitions of an MMO:

MMO: Individual responsible for conducting visual watches for marine mammals. It may be requested that observers are trained, dedicated and/or experienced.

Trained MMO: Has been on a JNCC recognised course.

Dedicated MMO: Trained observer whose role on board a vessel is to conduct visual watches for marine mammals.

Experienced MMO: Trained observer with three years of field experience observing for marine mammals, and practical experience of implementing the JNCC guidelines.

The MMO will be land based and will be trained. The identity and credentials of the MMO will be agreed with Marine Scotland.

1.1.2 MMO Equipment

The MMO will be equipped with binoculars (10X42 or similar) and/or a spotting scope (20-60 zoom or equivalent), a copy of the agreed protocol and the Marine Mammal Recording Form (MMRF), which is a Microsoft Excel spreadsheet containing embedded worksheets named Cover Page, Operations, Effort and Sightings. A Microsoft Word document named Deck forms is also available, and the MMO

¹ It should be noted that these protocols do not document measures to mitigate disturbance effects but have been developed to reduce to negligible levels of risk of injury or death to marine mammals in close proximity to piling operations or explosives.

may prefer to use this when observing before transferring the details to the Excel spreadsheets. Although these forms were developed for seismic surveys, they can be used for piling operations, although many columns will not be applicable. The ability to determine the range of marine mammals is a key skill for MMOs, therefore a hand-held rangefinder will be used to verify the range.

All MMO forms, including a guide to completing the forms; and instructions on how to make a rangefinder are available on the JNCC website: http://jncc.defra.gov.uk/marine/seismic_survey

1.1.3 Communication

The contractor will be responsible for the communication channels between those providing the mitigation service and the crews working on the piling. A formal chain of communication from the MMO to the contractor, who will start/stop piling, will be established. In order to confirm the chain of communication and command the MMO will attend any relevant pre-mobilisation meetings.

1.1.4 Mitigation Zone

Following appointment of contractor / Ecological Clerk of Works (ECoW), logistical information will be available/ updated to provide more detailed mitigation zones for the MMO.

The JNCC guidance defines the mitigation zone as a pre-agreed radius around the blasting site prior to any blasting. This is the area where a MMO keeps watch for marine mammals (and delays the start of activity should any marine mammals be detected). The extent of this zone represents the area in which a marine mammal could be exposed to sound that could cause injury and will be determined by factors such as the number of blasts, the water depth, the nature of the activities (for example whether drilling will also take place) and the effect of the substrate on noise transmission. The radius of the mitigation zone should be no less than 750 metres, and this is measured from the blasting location. The MMO should be located on the most appropriate viewing platform to ensure effective coverage of the mitigation zone.

1.1.5 Passive Acoustic Monitoring (PAM)

Following appointment of contractor / Ecological Clerk of Works (ECoW), logistical information will be available/ updated to provide more detail in regard to the use of PAM.

In addition to MMOs (visual), Passive Acoustic Monitoring (PAM) should be undertaken throughout the operation.

PAM are software systems that utilises hydrophones to detect the vocalisations of marine mammals. This will help aid in the detection of species which are less easily detected or during unfavourable conditions.

Visual observation (MMO) is an ineffective mitigation measure during periods of darkness or poor visibility (such as fog), or during periods when the sea state is not conducive to visual mitigation, as marine mammals in the vicinity of explosive sources will not be detected. JNCC views PAM as the only available mitigation technique that can be used under these conditions, and that it can also be used to enhance the detection of certain marine mammal species².

² JNCC Guidelines for minimising the risk of injury to marine mammals from using explosives (2010), available at: <https://data.jncc.gov.uk/data/24cc180d-4030-49dd-8977-a04ebe0d7aca/JNCC-Guidelines-Explosives-Guidelines-201008-Web.pdf>

PAM systems consist of hydrophones that are deployed into the water column, and the detected sounds are processed using specialised software. PAM operatives are needed to set up and deploy the equipment and interpret the detected sounds. The PAM hydrophones should be situated as close as possible to the site of detonation, and sacrificial hydrophones may therefore be required.

Hydrophones deployed from standby vessels can be used for acoustic monitoring, but a disadvantage of these systems is that they will move away from the site of detonation when the vessel moves to the 'stand off' position prior to the detonation and may then be too far away to detect any marine mammal vocalisations within the mitigation zone. Remotely operated static PAM systems, which can be left at the detonation site, may be an option, but they may not always be commercially available, or best suited for operations in shallow coastal environments.

PAM can provide a useful supplement to visual observations undertaken by MMOs. However, in many cases it is not as accurate as visual observation for determining range, and this will mean that the mitigation zone will reflect the range accuracy of the system. Some PAM systems do not have a reliable range determination facility or can only calculate the range for some species. In such cases, the detection of a confirmed cetacean vocalisation should still be used to initiate postponement of the soft-start if the PAM operator is able to make a judgement about the range of the marine mammal (dependent on species) from the detonation, because of experience gained in differentiating between distant and close vocalisations. In the absence of PAM systems capable of range determination, this expert judgement will constitute the basis for deciding whether an area is free from cetaceans prior to the soft-start.

PAM monitoring will submit a method statement and details of the equipment to be used to MS-LOT for approval before the equipment is deployed.

1.1.6 Blasting Protocol

Following appointment of contractor / Ecological Clerk of Works (ECoW), logistical information will be available/ updated to provide more detail in regard to blasting protocols.

The standard JNCC protocol is outlined below (refer to section 1.2 for the Passive Acoustic Monitoring protocol to be followed during times of sea states above 3):

1. Visual monitoring will not commence during poor visibility (such as fog) or during periods when the sea state is not conducive to visual mitigation (above sea state 4 is considered not conducive³) as there is a greater risk of failing to detect the presence of marine mammals. In the event that visual monitoring is not possible, the protocol outlined in Section 1.2 should therefore be followed. Harbour porpoise have small dorsal fins, therefore the MMO shall take additional precautions if the sea state exceeds 2. An elevated platform for the MMO to monitor from would be beneficial when the sea state is 2 or above (where required), the blasting works could also be scheduled on a day where the sea is expected to be calm.

2. The MMO(s) should be situated in location that provides the best viewing platform and is likely to be closest to the explosive activities. For example, the existing pier or a vessels bridge that allows 360 degree cover (depending upon the size of the mitigation zone more than one MMO viewing platform (and therefore more than one vessel) may be required to ensure that the entire mitigation zone can be observed).

³ Detection of marine mammals, particularly porpoises, decreases as sea state increases. According to the JNCC guidance ideally sea states of 2 or less are required for optimal visual detection.

3. The mitigation zone will be monitored visually by the MMO for an agreed period prior to the commencement of piling. This will be a minimum of 30 minutes.
4. At least 1 hour before any type of detonation, a visual watch and, if required, acoustic monitoring, known as the 'pre-detonation search', should be carried out in the mitigation zone. The pre-detonation search should continue until the MMO advises that the mitigation zone is clear of marine mammals, and the detonation can start.
5. The MMO will scan the waters using binoculars or a spotting scope and by making visual observations. Sightings of marine mammals will be appropriately recorded in terms of date, time, position, weather conditions, sea state, species, number, adult/juvenile, behavior, range etc. on the JNCC standard forms. Communication between the MMO and the contractor and the start/end times of the activities will also be recorded on the forms.
6. Explosive detonations should not be undertaken within 20 minutes of a marine mammal being detected within the mitigation zone.
7. If a marine mammal is observed, or acoustically detected, within the mitigation zone, it should be monitored and tracked until it moves out of range. The MMO should notify the relevant chain of command of the detection and advise that the operation should be delayed. If the marine mammal is not detected again within 20 minutes, it can be assumed that it has left the area and the detonation may commence.
8. If an animal has been detected acoustically, the PAM operative should use a range indication and their judgement to determine whether the marine mammal is within the mitigation zone.
9. If an MMO or PAM operative is uncertain whether marine mammals are present within the mitigation zone, they should advise that the activity should be delayed as a precaution until they are certain that no animals are present.
10. A soft-start can be employed, with the gradual ramping up of PAM or small soft-start charges prior to blasting works². The soft-start duration will be a period of not less than 20 minutes. This will allow for any marine mammals to move away from the noise source.
11. If a marine mammal enters the mitigation zone during the soft-start then, whenever possible, the blasting operation will cease until the marine mammal exits the mitigation zone and there is no further detection for 20 minutes.

1.1.7 Reporting

As per the JNCC guidance, reports detailing the blasting activity and marine mammal mitigation (the MMO reports) will be sent to Marine Scotland at the conclusion of blasting activity. Reports will include:

- Completed MMRFs;
- Date and location of the blasting activities;
- A record of all occasions when blasting occurred, including details of the duration of the pre-piling/pre-blasting search and soft-start procedures, and any occasions when blasting activity was delayed or stopped due to presence of marine mammals;
- Details of watches made for marine mammals, including details of any sightings, and details of the blasting activity during the watches;
- Details of any problems encountered during the blasting activities including instances of non-compliance with the agreed blasting protocols; and

- Any recommendations for amendment of the protocols.

1.2 Acoustic Deterrent Device Protocol

JNCC state that using devices which have the potential to exclude animals from the mitigation zone should be considered. However, Acoustic Deterrent Devices (ADDs) should only be implemented in conjunction with visual and / or acoustic monitoring (PAM) and for as short period as necessary to minimise the introduction of additional noise.

ADDs are devices consisting of a control unit and a transducer (sound head). The control unit contains a pulse generator and an amplifier and transmits random burst of audio frequency signals to the transducer, where they are converted into sound. Marine mammals display avoidance reactions to these sounds.

The use of the following (ADD): <http://www.lofitech.no/en/seal-scarer.html> to provide mitigation has been reviewed by the Statutory Nature Conservation Bodies (SNCB) including NatureScot, Natural Resources Wales and Natural England⁴. It was concluded that:

The SNCBs consider the evidence presented to date shows that the Lofitech ADD device can elicit behavioral responses from harbour porpoise, displacing the majority of animals by hundreds of metres. Therefore the SNCBs consider that certain types of ADDs have the potential to be used as an alternative to the mitigation provided by MMOs and PAM for harbour porpoise. SNCB advice on cases applying to use ADDs as an alternative to MMOs/PAM will be considered on a case-by-case basis.

Following this statement, further research has been undertaken⁵ which highlights that the Lofitech ADD is effective at evoking a deterrence response in minke whales.

In addition, a JNCC Report⁶ which acts to provide a collated reference for SNCBs in the UK, to inform advice in relation to marine industries on the use of ADDs to deter marine mammals from areas where there is a risk of injury or death identified Fauna Gaurd:

<https://www.vanoord.com/en/sustainability/cases/faunaguard-minimising-potential-impact-generated-under-water-sound/> to provide blasting mitigation and has been found to elicit a behaviour response in harbour porpoise, displacing them by up to 1km.

The following protocol has been designed for use when:

- Blasting operations are to commence during hours of low visibility/ night-time; and
 - The sea state is 3 or above.
1. ADDs should be positioned in the water in close proximity to the explosive source installed; the vessel with the MMOs and PAM operatives may not be a suitable mooring location for these devices.
 2. ADDs should be switched on for a pre-determined number of emissions during the pre-detonation search and turned off immediately once the detonations have commenced.
 3. The MMO should maintain a post-detonation search within the mitigation zone for at least 15 minutes after the last detonation, to look for any evidence of injury to marine life, including fish kills. Any unusual observations should be noted in the report.

⁴ Joint Statutory Nature Conservation Bodies (2016) Position Statement

⁵ RPS (2017) ORJIP Project 4 Phase 2 Understanding the Effectiveness of Acoustic Deterrent Devices on Minke Whale

⁶ McGarry, T., De Silva, R., Canning, S., Mendes, S., Prior, A., Stephenson, S. & Wilson, J. 2022. Evidence base for application of Acoustic Deterrent Devices (ADDs) as marine mammal mitigation (Version 4). JNCC Report No. 615. JNCC, Peterborough. ISSN 0963- 8091

4. Clear communication channels should exist between MMO(s) / PAM operators and personnel detonating the explosives. It is recommended that communication channels should be established and in place before the activity commences, with these matters discussed and agreed at a pre-mobilisation meeting.

1.3 Vibratory Piling Mitigation Protocol

The requirement of an MMO for vibratory Piling is not considered necessary due to the underwater noise modelling displaying the risk of PTS and TTS for marine mammals of concern only extending out to a maximum of approximately 150m from the piling activity. A soft-start method/gradual ramp-up of power will likely deter marine mammals from staying within, or moving into the area where vibratory piling is ongoing.

1.4 Dredging Mitigation Protocol

The requirement of an MMO for dredging is not considered necessary due to the small TTS zones associated with the noise generated. Instead, dredging contractors should be made aware that marine mammals may be present within the working area, and broadly work to the vessel movement mitigation suggestions in section 1.5, below, to avoid disturbance to and/or collision with marine mammals.

1.5 Vessel Movement Mitigation Protocol

The Harbour Authority implement speed restrictions on vessels within Orkney waters, additionally, leaflets can be created to provide additional advice to harbour users to avoid disturbance to and/or collision with marine mammals which should include, but is not limited to the following:

- Keep a safe distance. Never get closer than 100m (200m if another boat is present) if within 100m, switch the engine to neutral;
- Never drive head on to, or move between, scatter or separate marine mammals. If unsure of their movements, simply stop and put the engine into neutral;
- Spend no longer than 15 minutes near the animals;
- Special care must be taken with mothers and young;
- Maintain a steady direction and a slow 'no wake' speed; and
- Avoid sudden changes in speed.

Wildlife code of conduct methods have been created by NatureScot and are available on their website.

1.6 Additional Good Practice Recommendations

If any dead cetacean is anecdotally observed during construction or operation, it should be reported to the Scottish Marine Animal Stranding Scheme (SMASS) (www.strandings.org) and live marine mammal strandings will be reported to British Divers Marine Live Rescue (www.bdmlr.org.uk).

The MMO should keep a record of all marine mammal sightings, whether in the mitigation zone or not, to be issued to NatureScot. An understanding of the location of species is essential to appropriately assess the impacts of a proposed development and plan and target effective mitigation, therefore this data could be used to inform future projects. Biodiversity data are extremely important as, aside from

use in planning and decision making, they are key to delivering state of environment reporting, education, modelling trends in species and habitat distribution, and research and policy making.