Project Title/ Location	MeyGen Tidal Energy Project, Phase 1a. Inner Sound.
Date:	20/05/2016

MeyGen Tidal Energy Project Phase 1 Environmental Management Plan: Construction Works

MEYGEN
THE TIDE OF CHANGE IN CAITHNESS

Rev	Prepared	Sign Off	Checked	Sign Off	Approved	Sign Off	Date of Issue	Comments
1	Redacted						30/05/2105	
2							29/07/2015	Consultation response from Historic Scotland and SNH

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EXECUTIVE SUMMARY

This Environmental Management Plan (EMP) has been prepared by MeyGen Ltd. to set out the proposed method for discharging the Condition 11 of the Section 36 Consent for the Development.

The document details the construction related mitigation methods proposed for the Development, how these are to be delivered in the construction procedures and good working practices for installing the Development, how this document integrates with the wider environmental management of the Development, and how communication will be maintained between the Principal Contractor, MeyGen Ltd. and the regulators.

The EMP presented within this document is to satisfy Condition 11 and enable construction of the Development to progress, subject to the EMP being implemented.

The EMP will be submitted to the to the Scottish Ministers for their written approval, in consultation with SNH and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers., and will be used, where appropriate, to inform the discharge of other Conditions within the Section 36 Consent which refer to it.

An EMP for HDD Marine Works (RHK-1A-40-HSE-001-D-EMPHDD) has already been consulted on and approved by Scottish Ministers. This EMP is for the remaining Construction Works for Phase 1a; this includes the installation of:

- 4 x Turbine Subsea Cable (TSC);
- 4 x Turbine Support Structure (TSS); and
- 4 x Tidal Turbine Generator (TTG).

1 INTRODUCTION

The MeyGen Tidal Energy Project Phase 1 ("the Development") received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers 9th October 2013 ("the S.36 Consent"). This Environmental Management Plan (EMP) is prepared to enable Condition 11 of the S.36 Consent ("the Condition") to be discharged. Condition 11 states:

> *The Company must, no later than 3 months prior to the Commencement of the Development, submit in writing an Environmental Management Plan ("EMP") to the Scottish Ministers for their written approval, in consultation with SNH and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers. The final draft of the EMP must have been approved by the ECoW prior to its submission to the Scottish Ministers.*
>
> *The EMP (and, as the case may be, amended EMP) must detail measures that must be taken by the Company, through all stages of the Development, to prevent adverse impacts including, but not limited to, marine mammals, birds, fish and habitats as outlined in Chapter 25 of the Company's Environmental Statement. The EMP must take account of, and implement, recommendations where appropriate and reasonable from the CMS, the Operations & Maintenance Programme, the Vessel Management Plan and the Navigational Safety Plan, as well as any other recommendations within the Company's Environmental Statement.*
>
> *The EMP must be regularly reviewed by the Scottish Ministers, at timescales to be determined by the Scottish Ministers, in consultation with SNH, the ECoW and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers. Following such review the Scottish Ministers may, in consultation with SNH, the ECoW and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers, require the Company to amend the EMP and submit such an amended Plan to them, in writing, for their approval. The Scottish Ministers may approve an amended Plan in consultation with SNH, the ECoW and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers.*
>
> *The EMP must, so far as is reasonably practicable, be consistent with any relevant monitoring requirements during construction taken from the Project Environmental Monitoring Programme.*
>
> *The Environmental Management Plan must be implemented in full by the Company.*

This document sets out the proposed EMP that MeyGen Ltd ("MeyGen") intends to undertake, to allow Condition 11 to be discharged.

2 SCOPE OF THE ENVIRONMENTAL MANAGEMENT PLAN

This EMP has been developed in accordance with the Institute of Environmental Management and Assessment (IEMA) Practitioner "Environmental Management Plans", Best Practice Series, Volume 12, December 2008.

MeyGen commits to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts associated with the development, construction and operation of the Development.

The principle objectives of the EMP are to:

- Identify avoid, minimise and control adverse environmental impacts associated with the Development; and
- Define good practice as well as specific actions required to implement mitigation and monitoring requirements as identified in the ES, and the licensing and consenting process.

The Development must, at all times, be constructed and operated in accordance with the approved EMP (as updated and amended from time to time). Any updates or amendments made to the EMP by MeyGen must be submitted, in writing, by MeyGen Ltd. to the Scottish Ministers for their written approval.

The EMP must be in accordance with the Environmental Statement (ES) and Supplementary Environmental Information Statement (SEIS) as it relates to environmental management measures.

The EMP (S.36 Consent, Condition 11) includes the Marine Pollution Contingency Plan (Marine Licence, Condition 3.2.13) and Reporting Protocol for the Discovery of Marine Archaeology (S.36 Consent, Condition 16).

The EMP forms part of a suite of documents related to the consent conditions that MeyGen seek to discharge:

- Construction Method Statement (CMS) (S.36 Consent, Condition 9), including Cable Installation Plan (Marine Licence 3.2.1.8) and Cable Protection Plan (Marine Licence 3.2.1.9);
- Navigation Safety Plan (NSP) (S.36 Consent, Condition 17); and
- Vessel Management Plan (VMP) (S.36 Consent, Condition 14).

Phase 1a of the Development is a 6MW, 4 tidal turbines initial phase to be installed and operatives under the restriction placed on the Development by Condition 2 of the S.36 Consent.

This document, as agreed with the licensing authority, updates the original Environmental Management Plan (EMP) (MEY-1A-40-HSE-F-002-EMPConstructionWorks) submitted to Marine Scotland on 29/07/2015. This update is required to include reference to using a Jack-Up Vessel (JUV) in addition to, or as an alternative to, using a Dynamic Positioning Offshore Construction Vessel (DP OCV) during installation of the Turbine Support Structures (TSS) and

Tidal Turbine Generators (TTGs).

It is also noted that, although the Turbine Subsea Cables (TSC) have now been installed (August 2015), to ensure consistency with the original CMS, reference to the TSCs is still included in this document as part of the overall '**Construction Works**' for the Phase 1a infrastructure (the location of which is shown in Figure 1). **The Construction Works** also include 4 x Tidal Turbine Generators (TTG) and 4 x Gravity-base Turbine Support Structures (TSS).

MeyGen has previously produced an EMP for the HDD Marine Works (RHK-1A-40-HSE-001-D-EnvironmentalManagementPlanHDD), which was consulted on and approved by Scottish Ministers.

2.1 Environmental Management Plan (EMP)

The EMP is in accordance with the Environmental Statement (ES) and the Supplementary Environmental Information Statement (SEIS).

It is intended that this EMP will be regularly reviewed throughout the planning and development of specific marine activities and revisions approved by the Scottish Ministers in accordance with the Condition. The system of review, update, consultation and approval (Section 11) during construction and operation is to ensure and achieve continual improvement aligned with ISO14001 principles.

The document contains the following sections:

- Licences and Legal Requirements;
- Communications Roles and Responsibilities;
- Marine Mammals;
- Marine Pollution Contingency Plans;
- Invasive Species Management;
- Reporting Protocol for the Discovery of Marine Archaeology;
- Waste Management;
- EMP Review and Consultation;
- Linkages with Other Conditions; and
- References.

3 COMMUNICATION, ROLES AND RESPONSIBILITIES

This section details the Development team roles, responsibilities and lines of communication during the construction and operation of the Development.

3.1 Responsibilities and Ownership

The Principal Contractor (PC) will have the ultimate responsibility for ensuring the implementation of the EMP.

The Ecological Clerk of Works (ECoW) will provide quality assurance and approval of any version of the EMP.

Any updates to the EMP by the PC will require the ECoW to check compliance with current legislation, consent conditions and related documents. Updated EMP will then be submitted to Scottish Ministers for approval.

3.2 Organisational Chart

The organisational chart for the HDD Marine Works is below in Figure . This includes how communication as part of the EMP will be conducted in normal working procedures and in the case of emergencies.

The organisation chart presents the key interfaces, lines of communication and responsibilities with regards to the flow of requirements and provision of mitigating actions across the HDD Marine Works.

Details of contacts relevant to the delivery of this plan are included in the Construction Phase Emergency Response Cooperation Plan (CPERCoP) and the Construction Phase Health and Safety Plan (CPH&SP).

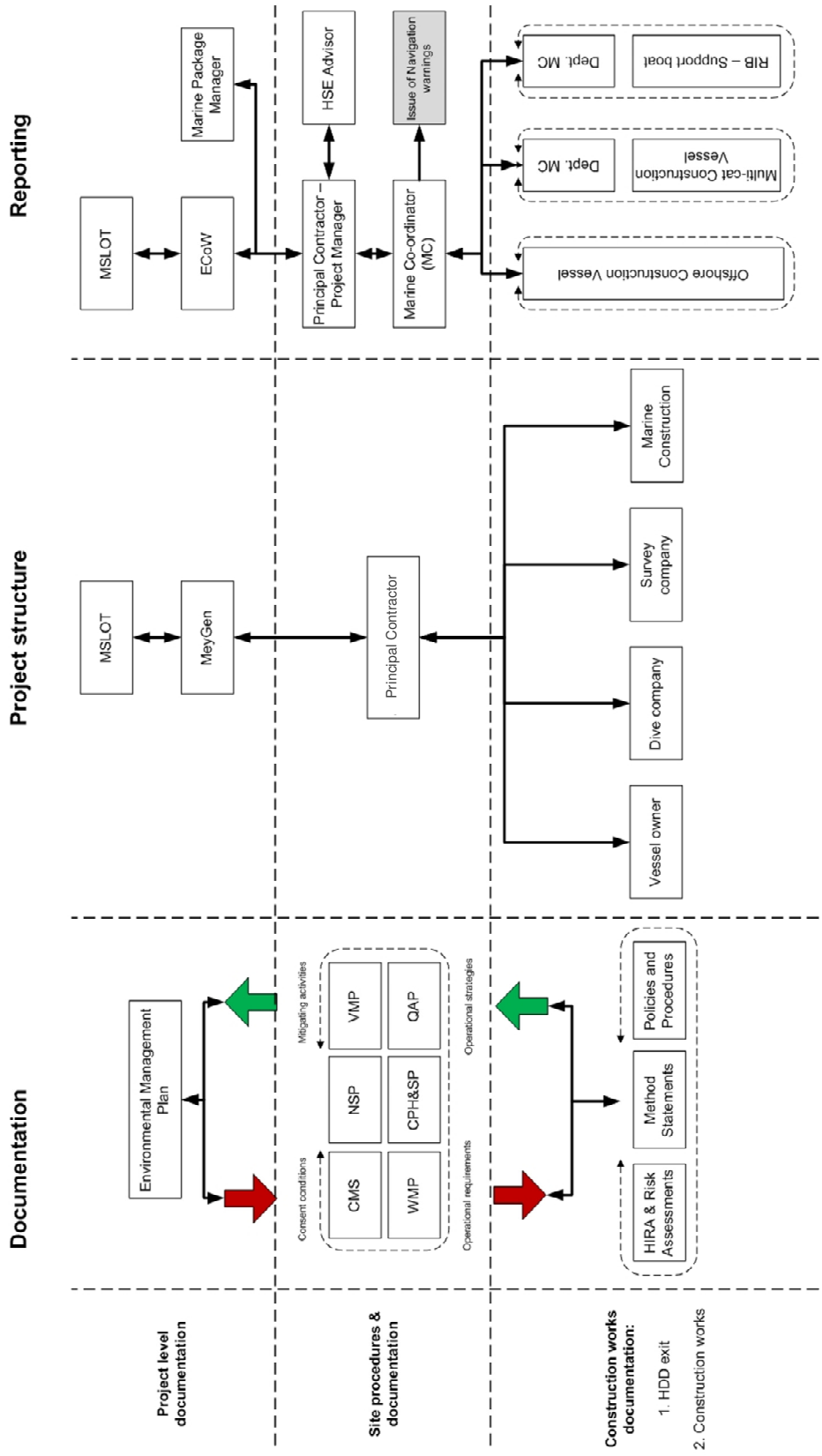

Figure 1 Key interfaces and organisation chart

3.3 MeyGen - Ecological Clerk of Works

- Review and approve all consent related documents (S36 Condition 10).
- Review / comment on content of Site Inductions and Toolbox Talks.
- Review / comment on Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and controls.
- Inspect the site / vessel / JUV on a regular basis to ensure effective implementation/operation of all environmental mitigation measures.
- Audit PC procedures, inspections, investigation and reporting.
- Ensure compliance with approve consent related documents, environmental legislation and requirements and address any shortfalls with the PC (S36 Condition 10).
- Review environmental incidents / near misses and PC investigations
- Report compliance and incidents to the licensing authority and other necessary regulatory authorities.
- Notify the licensing authority of vessel / JUV details (ML Condition 3.1.3)
- Notify the licensing authority of the commencement date and the completion date (ML Condition 3.2.1.4)
- Provide an update report should any unexpected delays to construction be encountered
- Provide Transport Audit Sheets for works to the licensing authority (ML Condition 3.2.2.1)
- Notify the licensing authority of deposits by MHWS (ML Condition 3.2.2.2)
- Ensuring any protected species licenses are in place for the Development (S36 Condition 10)

3.4 Principal Contractor

3.4.1 Project Manager

- Facilitate dissemination of specific environmental requirements to the project team.
- Oversee the implementation and review of environmental procedures throughout the project.
- Review and approve all consent related documents, including, but exhaustive, CMS, VMP and NSP.
- Monitor the environmental performance of the project through maintaining an overview of incidents, inspections and audits.
- Ensure that environmental considerations form an integral part of Design and Implementation of the Works and to include environmental reviews as part of regular project meetings.
- Review and approve Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and mitigation.

- Ensure that all environmental incidents are reported to the ECoW and MeyGen in accordance detailed reporting requirements and the respective regulatory bodies (where required) as soon as possible.
- Review environmental matters with the ECoW and MeyGen and respective regulatory bodies on a regular basis and as per project requirements.
- Ensure that arrangements for liaison with Development respective regulatory bodies on all environmental issues is appropriate and maintained.
- Implement and maintain a project communications strategy to manage project public relations and complaints.
- Produce weekly and monthly reports and submit to MeyGen Package Manager and ECoW.
- Ensure contractors are approved, operates a Safety Management System, confirm that they are suitably qualified in their line of work and have undertaken suitable environmental training to cover tasks to be undertaken.

3.4.2 HSE Advisor

The HSE Advisor is nominated by the Principal Contractor. Key roles and responsibilities of the HSE Advisor include, but are not limited to the following:

- Verify compliance with relevant legislation.
- Prepare, implement, review and update consent related documents (in conjunction with the Project Management Team) in accordance with consent condition, Principal Contractor procedures and current legislation.
- Advise the project team on environmental related decision making
- Review Risk Assessments and Method Statements (RAMS) as and where necessary with respect to environmental impacts and mitigation.
- Approve Toolbox Talks and Site / Vessel / JUV Inductions and ensure content promotes effective environmental management, specific works and site / vessel / JUV sensitivities and communicate associated lessons learnt.
- Provide support to the Marine Coordinator and workforce on any environmental matters that may arise.
- Audit contractors to confirm that they are suitably qualified in their line of work and have undertaken suitable environmental training to cover tasks to be undertaken.
- Ensure suitable consideration is given to the period and frequency of environmental monitoring (particularly with respect to higher risk areas).
- Inspect and audit the site / vessels / JUV on a regular basis to ensure effective implementation / operation of any environmental mitigation measures.
- Ensure compliance with environmental requirements and address any shortfalls.
- Provide inspection reports to the project management detailing any issues that must be addressed
- Undertake investigations into environmental incidents or near misses to determine the root/direct cause and present the findings, recommendations and lessons learnt.

- Monitor hazardous observations and incidents trends in relation to environmental aspects and impacts and initiate actions as required to minimise the potential environmental impacts and reduce risk in a timely and effective manner.

3.4.3 Marine Coordinator

- Responsible for all construction operations Marine Coordination including site / vessel / JUV HSE during construction operations.
- Ensure that all contractors have received and understood the Site / Vessel / JUV Induction.
- Undertake Toolbox Talks to promote effective environmental management and communicate associated lessons learnt.
- Monitor and disseminate weather information and forecasts.
- Production of marine safety alerts including issuing Notice to Mariners to agreed stakeholder list.
- Responsible for collating, communicating and responding to statutory navigation notices.
- Liaise with port authorities.
- Implement / operate environmental mitigation measures as approved in the consent related documents at the site / vessel / JUV.
- Coordinating, ensuring compliance for and recording all vessel / JUV movements and personnel movements offshore.
- Emergency response coordination.
- Produce daily reports and submit to the PC Project Manager, MeyGen Package Manager and ECoW.
- Keep Transport Audit Sheets for all materials listed in the licence to be deposited as part of the works
- Keep audit reports stating the nature and quantity of all substances and objects deposited below MHWS under the authority of the licence.

3.5 Contractors

3.5.1 Vessel / JUV Master

- Overriding authority and responsibility to make decisions with respect to safe navigation of the vessel / JUV and matters related to HSE.
- Dedicated watch-keeper on board the vessel / JUV, or nominate suitable qualified deputy.
- The persons present on board must adhere to the Vessel / JUV Master's instructions.
- Adhere to IMO International Regulations for the Prevention of Collisions at Sea.
- Ensure that all contractors have received and understood the Vessel / JUV Induction.

3.5.2 All Other Staff

- To understand and implement procedures relevant to their role as laid out.
- To conduct their work with a view to eliminating/reducing the environmental impact of the Development and to raise any environmental concerns with Marine Coordinator or Project Manager.
- To report all environmental incidents to the Marine Coordinator and Vessel / JUV Master as soon as possible.

3.6 Communication

Environmental issues will be formally communicated through the arrangements on site as listed in Table 1.

Meeting/briefing	Frequency	Attendees
Safety, Health, Environment, Security and Quality (SHESQ) and Progress Meeting	Weekly	See paragraph below
Daily site team briefs	Daily	All work parties
Risk Assessment/Method Statement briefings	Each job task	All members of the working party
Toolbox Talks including environmental practices and mitigation measures	Before mobilisation, or a minimum of one per week	All site / vessel / JUV personnel
Site / Vessel / JUV Induction	On first attendance at site / vessel / JUV BEFORE any work is undertaken	All persons attending site / vessel / JUV

Table 1 Communication and Meetings

3.6.1 SHESQ and Progress Meeting

The PC shall convene weekly site / vessel / JUV meetings with all contractors on site / vessel / JUV to communicate, discuss and consult any change in conditions, working practices and environmental arrangements, procedures and overall environmental performance.

The ECoW and representatives from MeyGen and other interested Third Parties shall have an open invitation to attend these weekly site / vessel / JUV meetings. Each contractor on site / vessels / JUV shall nominate a person to attend these meetings with the appropriate authority to act on those contractors behalf. SHESQ and Progress Meetings shall be augmented by additional meetings at intervals dictated by the requirements of the contract or at key stages of the works.

Minutes of all such meetings shall be produced and held on file for record purposes, with copies supplied to each contractor on site / vessel / JUV, the CDM Co-ordinator and ECoW.

3.6.2 Extraordinary meetings

Extraordinary meetings would be held in order to deal with special environmental issues that may arise during the Development such as environmental incidents. These meetings shall be organised by the HSE Advisor with the aim of ensuring a timely response and resolution to any identified issues.

3.6.3 Daily site / vessel / JUV team meetings

Daily site team meetings will take place at the Onshore / Offshore site between the PC and contractors. Any environmental concern shall be addressed at this meeting.

3.6.4 Risk Assessment / Method Statement briefings

These briefings will take place before each construction task and attended by all directly involved in the task. Environmental requirements and mitigation measures will be instructed and reviewed.

3.6.5 Site / Vessel / JUV Inductions

Inductions, conducted before anyone commences work on the project are utilised to raise awareness for personnel regarding site / vessel / JUV rules, emergency response procedures and environmental protection arrangements. The inductions include a test to confirm understanding.

3.6.6 Site / vessel / JUV notice boards

Site / vessel / JUV notice boards will contain relevant site / vessel / JUV information relating to Health, Safety and Environmental issues. The site / vessel will also have appropriate signage in place to highlight awareness of environmental hazards. Other communications media, such as newsletters and posters will also be posted on notice boards to communicate awareness of environmental matters.

3.7 Reporting

The PC will communicate the following to the ECoW and contractors on site:

- Details of audits and inspections;
- Details and statistics for environmental incidents and near misses;
- Details of any pending and actual enforcement action in respect of any environmental incidents;
- Any other pertinent environmental issues identified;
- Transport Audit Sheets (MEY-1A-40-HSE-004-D-TransportAuditSheet) (beginning of each month); and
- Audit reports for the nature and quantity of all substances and objects deposited below MHWS (MEY-1A-70-HSE-005-D-DepositAuditSheet) (every 6 Months).
- Marine Mammal reports (MEY-1A-70-TEM-009-MarineMammalReport) (daily during marine operations)

The PC will provide these in:

- Daily logs and reports when construction activities are taking place on site / vessels / JUV;
- Weekly progress reports; and
- Monthly reports (additionally, confirming the status of the project, implementation of environmental commitments and mitigation measures, monthly and cumulative statistics, training delivered, environmental initiatives undertaken, amendments to the any of the consents related documents).

3.7.1 External Communication

The Marine Coordinator is responsible for:

- Documenting, issuing, communicating and responding to statutory navigation notices for the Development; and
- Emergency Response Co-operation Procedures are in place for such events. The communication and reporting protocols for such an event can be found in the Emergency Response Plan (see the NSP).

The ECoW is responsible for:

- Notification to the licensing authority detailed in the consent condition;
- Reporting monthly to the licensing authority once works have commenced with:
    - Details of audits and inspections;
    - Details and statistics for environmental incidents and near misses;
    - Details of any pending and actual enforcement action in respect of any environmental incidents;
    - Any other pertinent environmental issues identified;
    - Any unexpected delays to construction should they be encountered;
    - Transport Audit Sheets; and
    - Audit reports for the nature and quantity of all substances and objects deposited below MHWS.
- Meeting with the licensing authority and statutory agencies and the local community; and
- Receiving, documenting and responding to any environmental communication from third parties.

3.8 Training

The purpose of environmental training is to ensure that all site personnel have the knowledge to successfully implement the environmental requirements of the project.

In order to ensure that the environmental mitigation measures are implemented on site / vessel

/ JUV, the following environmental training Table 2 in will be required.

Training	Target Persons
Induction (which will include environmental aspects such as environmental sensitivities and controls, pollution prevention, waste management and emergency preparedness and response). For Marine Mammals, this should include identification, behaviour and sensitive periods for known species and introduction to Scottish Marine Wildlife Watching Code.	All persons attending site / vessel / JUV (site / vessel / JUV personnel, contractors on site / vessel / JUV, and visitors).
Environmental Toolbox Talks	Toolbox talks will be carried out at a minimum of one per week appropriate to the construction works being carried out on site / vessel / JUV at that time. All persons carrying out work on site / vessel / JUV (site / vessel / JUV personnel, contractors on site / vessel / JUV) shall attend.
Environmental Bulletins / Legislation Briefings / Best Practice Briefings	All persons carrying out work on site / vessel / JUV (site / vessel / JUV personnel, contractors on site / vessel / JUV) shall attend.
Job specific training e.g. • IOSH Working with Environmental Responsibilities / IOSH Managing Environmental Responsibilities. • Use of Pollution Prevention Equipment. • Site Waste Management.	As identified for personnel with environmental responsibilities
Project specific information, including relevant elements of: • the EMP, CMS, NSP, VMP • Consent Conditions	Briefed out and available for reference to all site / vessel / JUV staff.

Table 2 Training

Any person working on the site / vessel / JUV will be competent and trained sufficiently to undertake their work in a safe and efficient manner. Each Contractor will ensure that their personnel maintain the necessary level of competence for their work & will maintain the training records on site & make them available for review and audit. Records of training will be maintained and made available for inspection.

4 METHOD STATEMENT AND PROGRAMME

The full Construction Works method and programme can be found in the Construction Method Statement (MEY-1A-40-HSE-004-D-CMSConstructionWorks).

4.1 Turbine Subsea Cable (TSC) Works Summary

The installation process will pull 4 x TSC from offshore via the HDD ducts to onshore and then lay the TSC along to the seabed to the 4 x TSS locations. Full installation details can be found in the Construction Method Statement (MEY-1A-40-HSE-004-F-CMSConstructionWorks).

The installation will use:

- 1 Cable Laying Vessel (CLV); and
- 1 multi-cat type vessel.

The key elements of the TCS installation are:

- Complete TSC route and TTG seabed survey using ROV / Drop-down camera from the multi-cat vessel prior to operations.
- Divers from a multi-cat will remove the HDD exit cap, install a bellmouth to the HDD liner and a pull the winch wire through the HDD liner.
- Mobilise the Cable Laying Vessel (CLV);
- The TSC will be mobilised direct from the cable manufacturer (Hartlepool);
- The CLV will transit to site, position and hold station to the north of HDD exit points.
- The TSC will be paid out from the CLV, floated and directed by a multi-cat vessel towards the HDD exit point.
- The TSC will be connected to the pre-installed winch wire in HDD bore.
- An onshore winch will then begin to pull the TSC through the HDD bore as it is paid out from the CLV.
- The Multi-cat will monitor progress and release the floats attached to the TSC.
- When the TSC has reached the onshore site it will be temporarily secured.
- The CLV will then begin to lay the TSC along the design route towards the TSS locations (Figure 2 and **Error! Reference source not found.**3).
- TSC is set down near the Turbine Support Structure (TSS) and laid down with a temporary dead man anchor.
- Cable stability measures will be marshalled from Scrabster Harbour, loaded onto a suitable DP vessel.
- Cable stability measures will be overboarded from the DP vessel crane into position determined by previous analysis
- Demobilise vessels
- The process will be repeated for 4 x TSC.

4.2 Turbine Support Structure (TSS) Works Summary

The TSS Works includes the installation of the 4 x TSS and ballast blocks at their target locations. Full installation details can be found in the Construction Method Statement (MEY-1A-40-HSE-004-F-CMSConstructionWorks).

Two approaches are being considered for installation of the TSSs. These include:

- Installation Approach 1 (Jack-Up Vessel (JUV) and Dynamic Positioning (DP) vessel); and
- Installation Approach 2 (DP Offshore Construction Vessel (OCV)).

The key elements of the TSS installation process are:

4.2.1 Installation Approach 1 – JUV and DP OCV

- Mobilisation of JUV and DP vessel prepared with the necessary grillages and sea fastenings.
- The 2 x TSS tripod will be loaded from Nigg Energy Park onto the JUV for transit to site. Transit may be assisted by a tug with the JUV under tow between Nigg and the MeyGen site.
- The JUV will prepare for the installation operation at a suitable off-site holding location identified during the pre-installation survey.
- On arrival at the site, the JUV waits for slack tide before moving into position over the TSS location.
- The JUV will elevate to an operating height above the sea.
- Lifting rigging incorporating hydraulic release shackles and monitoring equipment (sub-sea cameras and acoustic beacons) will be used to lift and locate the TSS on the seabed.
- The sea fastenings would be released, the TSS weight taken by the JUV crane and moved overboard to wait for acceptable tidal flow conditions. The tidal rate would be closely monitored using live current data. As soon as the reducing tidal flow has reached the acceptable agreed rate, the lift would be lowered towards the seabed.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the TSS onto the seabed.
- Following the installation of the TSS, a Platform Supply Vessel (PSV) would be used to bring 6 ballast blocks from Scrabster Harbour to the MeyGen site.
- The PSV would be mobilised and prepared with suitable grillages for the carriage of the ballast blocks.
- A shore crane would be used to load 6 ballast blocks onto the PSV for transport to the MeyGen site.
- Upon completing the installation of the TSS, the PSV would be called alongside the JUV and while the PSV holds station on DP OCV, the JUV would lift a pair of ballast blocks from the PSV and install these blocks onto the TSS.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the ballast blocks on the TSS.

- This operation would be repeated three times.

The JUV would then jack down and move to the next installation location before the operation is repeated. The entire process would then be repeated to install the remaining two TSSs.

4.2.2 Installation Approach 2 – DP OCV

- Mobilisation of the DP OCV prepared with the necessary grillages and sea fastenings to suit carriage of the TSS.
- 2 x TSS are loaded directly from Nigg Energy Park onto DP OCV and transit to site.
- The DP OCV will prepare for the installation operation off site at a suitable holding location identified during the pre-installation survey.
- The DP OCV waits for slack tide before moving into position over a TSS location.
- The DP OCV will hold position over the TSS location using DP.
- A lift frame incorporating sub-sea cameras and acoustic beacons, will be used on the DP OCV along with traditional rigging. This would be attached to the TSS lifting points through the use of hydraulically actuated pins.
- The sea fastenings would be released, the TSS weight taken by the vessels crane and moved overboard to wait for acceptable tidal flow conditions. The tidal rate would be closely monitored using live current data. As soon as the reducing tidal flow has reached the acceptable agreed rate, the lift would be lowered towards the seabed.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the TSS onto the seabed.
- The DP OCV will prepare the next tripod lift at a suitable holding location whilst waiting for the next slack tide.
- The DP OCV will complete the 2nd tripod lift using the same method.
- Following the 2nd tripod installation a second DP OCV will install the ballast blocks collected from Scrabster Harbour.
- This second vessel would be mobilised and prepared with suitable grillages for the carriage of the ballast blocks;
- A vessels crane would be used to load 6 ballast blocks onto the Seafasteners for transport to the MeyGen site.
- The DP OCV will sequentially install ballast blocks to the TSS. One per slack tide window. The DP OCV will plan and prepare for each subsequent lift in between slack tides.
- A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the ballast blocks on the TSS.
- This sequence would be repeated for the second TSS installed in the previous activity.

This sequence would then be repeated for the 3rd and 4th TSS and ballast blocks.

4.3 Tidal Turbine Generator (TTG) Works Summary

Two types of TTG will be installed during Phase 1a, 1 x Atlantis TTG and 3 x Andritz Hammerfest TTG. The installation methods are largely similar, with both involving positioning

the TTG on the TSS and connecting mechanical and electrical connectors, however, some differences exist, largely related to methods of electrical connection.

As with the TSSs, two approaches for installation of the TTGs are being considered based on using either:

- 1 DP Offshore Construction Vessel; or
- 1 Jack-Up Vessel (JUV).

4.3.1 Atlantis TTG installation

The key elements of installation for the Atlantis Resources Limited (ARL) TTG are summarised below:

- TTG and associated components and equipment are assembled at Nigg Energy Park. A DP OCV / JUV is prepared with the necessary grillages and sea-fastening.
- TTG and equipment is loaded onto the DP OCV / JUV.
- The DP OCV / JUV transits to site from port. Transit of the JUV may be assisted by a tug with the JUV on tow between Nigg and the MeyGen site.
- The DP OCV / JUV will prepared for the installation operations at a suitable off-site holding location identified during the pre-installation survey.
- The DP OCV / JUV waits for slack tide before moving into position over the TSS location.
- The DP OCV will hold position over the TSS / TTG location on DP.
- The JUV will elevate to an operating height above the sea.
- The end of TSC is retrieved from the seabed, and fixed to a back-pack cable management system.
- The back-pack structure is installed onto the TSS using an ROV to monitor installation.
- An active lift frame incorporating sub-sea cameras, acoustic beacons, gyros and inclinometers will be used for the TTG. This would be attached to the TTG lifting points through the use of hydraulically actuated pins.
- When approaching the slack tide the turbine would be moved overboard to wait for acceptable tidal flow conditions. The tidal rate would be closely monitored using live current data. As soon as the reducing tidal flow has reached the acceptable agreed rate, the lift would be lowered towards the substructure.
- The TTG connection will be monitored using the active lift frame, with small positional corrections being made by crane driver.
- Once the TTG is positioned on the TSS, the lift frame would be remotely disengaged from the TTG lifting points and recovered to the surface.
- Installing the TTG on the TSS the electrical connection in the back-pack is made.
- The DP OCV / JUV would then move off site with the installation complete.

A Remotely-Operated Vehicle (ROV) will provide a live video feed of the installation of the TSS onto the seabed and ensure the installation parameters are met.

4.3.2 Andritz Hammerfest Hydro (AHH) TTG installation

The key elements of installation for the Atlantis TTG are summarised below:

- TTG with TSC tail and equipment are assembled at Scrabster Harbour.
- A DP OCV / JUV is prepared with the necessary grillages and sea-fastening.
- TTG and equipment is loaded onto the DP OCV / JUV.
- The DP OCV / JUV transits to site from port. Transit of the JUV may be assisted by a tug with the JUV on tow between Nigg and the MeyGen site.
- The DP OCV / JUV waits for slack tide before moving onto DP station at the TSS location.
- The DP OCV will hold position over the TSS / TTG location on DP.
- The JUV will elevate to an operating height above the sea.
- The TSC is retrieved to the vessel / JUV deck and the TTG cable tail is connected to the TSC.
- An active lift frame incorporating sub-sea cameras, acoustic beacons, gyros and inclinometers will be used for the TTG. This would be attached to the TTG lifting points through the use of hydraulically actuated pins.
- When approaching the slack tide, the turbine would be moved overboard to wait for acceptable tidal flow conditions. The tidal rate would be closely monitored using live current data. As soon as the reducing tidal flow has reached the acceptable agreed rate, the lift would be lowered towards the substructure.
- The TTG connection will be monitored using the active lift frame, with small positional corrections being made by crane driver.
- The TTG and TSC tail are lowered simultaneously using a tandem lift operation. The TTG is installed on the TSS.
- The end of TSC is retrieved from the seabed via an ROV.
- Both TSC and TSC tail will be clamped on deck and a dry-mate jointing operation commences.
- The connected TSC will then be laid back on the seabed
- OCV / JUV is demobilised.
- The operation will be repeated for 3 x Andritz Hammerfest TTG.

4.4 TSS / TTG locations

The position / locations of the TTGs are shown in Table 3 and Figure 2.

Error! Reference source not found.	**Model**	**Eastings**	**Northings**
1	AHH 1	491819.6 E	6502207.8 N
2	AHH 2	491776.6 E	6502123.6 N
3	AHH 3	492026.2 E	6502159.8 N
4	ARL 1	492008.0 E	6502020.0 N

Table 3 TTG locations – UTM30 / WGS84

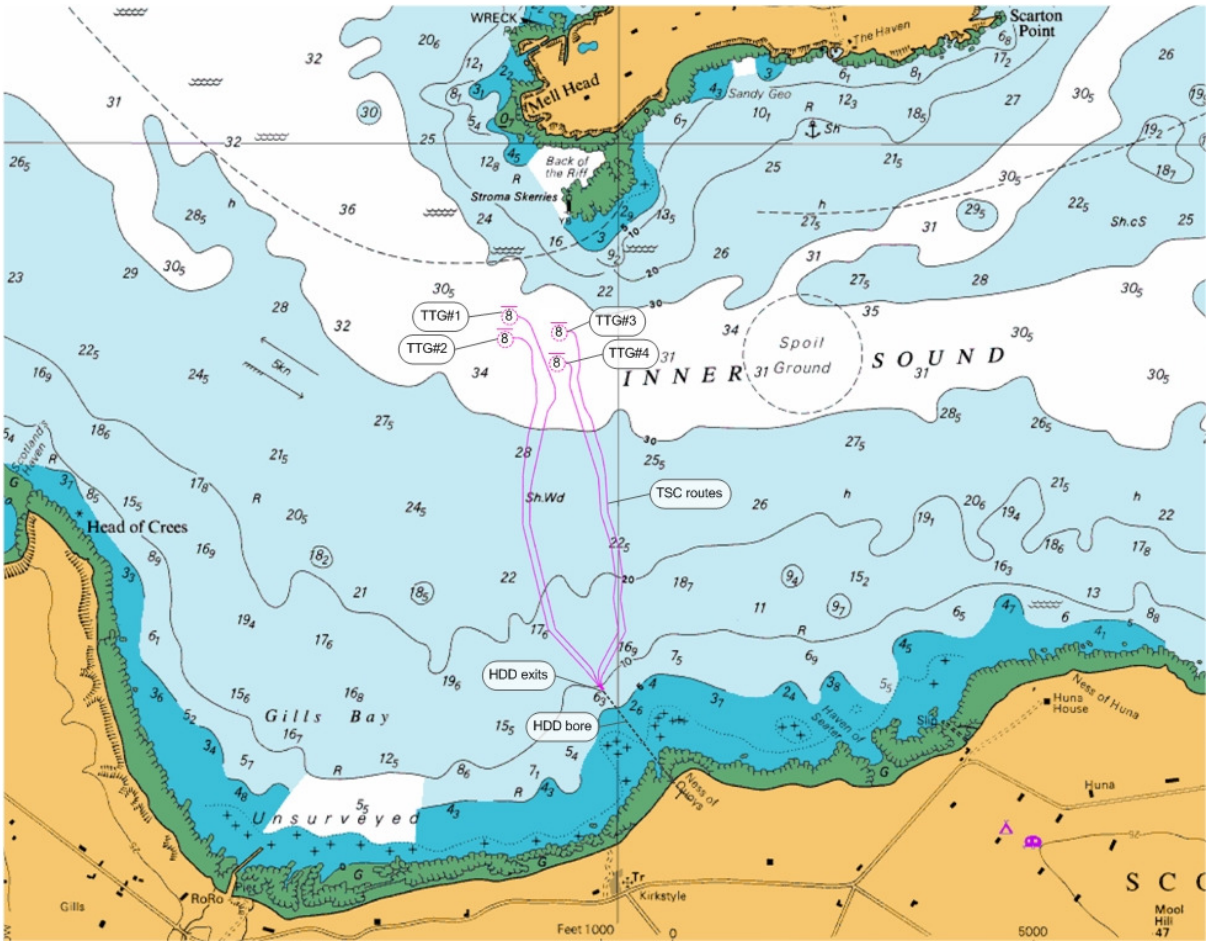

Figure 2 TSC route and TTG positions

4.5 Programme

The programme for TSS and TTG installation is presented in Figure 3 below.

Figure 3 TSS and TTG installation programme

5 MARINE MAMMAL MANAGEMENT

5.1 Key sensitivities and associated legislation

Chapter 11 of the Environmental Statement (ES), Marine Mammals, identifies harbour porpoise, grey seal and common seal as the key sensitivities during construction work.

In Scotland cetaceans (whales and dolphins) and pinnipeds (seals) are protected under a wide range of national and international legislation.

5.1.1 Habitats Directive

All species of cetacean are European Protected Species (EPS) under Annex IV of the Habitats Directive (European Union (EU) Directive 92/43/EEC) because they are classified as being of conservation interest and protection is to maintain or restore favourable conservation status.

Harbour porpoise *Phocoena phocoena* and bottlenose dolphin *Tursiops truncatus* along with grey seal *Halichoerus grypus* and harbour seal *Phoca vitulina* are listed as Annex II of the directive as species for which a network of Special Areas of Conservation (SACs) are to be designated.

The Habitats Regulations 1994 (as amended in Scotland in 2004, 2007, 2008(a) and 2008(b)) implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). Part II of the Habitats Regulations outlines protection for SACs, designated for habitats listed under Annex I of the Habitats Directive or species listed under Annex II of the Habitats Directive. Part II of the Habitats Regulations details the protection given to EPS.

A license is required if the risk of injury or disturbance to EPS is assessed as 'likely' under regulations 41(1)(a) and (b) in The Conservation of Habitats and Species Regulations and 39(1)(a) and (b) in The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (amended in 2009 and 2010).

5.1.2 Wildlife and Countryside Act and Nature Conservation (Scotland) Act

The Wildlife and Countryside Act (1981) ratified the provisions of the Convention on the Conservation of Migratory Species (The Bonn Convention), which aims to conserve migratory species and their habitats. Short-beaked common dolphin *Delphinus delphis* is afforded strict protection as an endangered migratory species, listed under Appendix 1 of the Convention. The Nature Conservation (Scotland) Act 2004 amends and improves the species protection provided by the Wildlife and Countryside Act 1981 to provide extension to existing protections for cetaceans from intentional disturbance to encompass protection from reckless disturbance as an offence.

5.1.3 Marine (Scotland) Act 2010

Under the Marine (Scotland) Act 2010 it is an offence to kill, injure or take a seal at any time of year except to alleviate suffering or where a licence has been issued to do so by the Scottish Government. It is an offence to harass seals at haul-out sites which have been identified for protection under Section 117 of the Marine (Scotland) Act 2010. Grey seal and harbour seal

are also listed on Annex V of the Habitats Directive, which requires their exploitation or removal from the wild to be subject to management measures.

The closest seal haul-out sites are at Gills Bay and the island of Stroma (Figure).

5.1.4 Seal Pupping and Moulting Periods

Grey seal breeding season is generally through October and November followed by a moulting period for January – March for females and March – May for males.

Harbour seal pupping season is generally through June and July followed by moulting in July and August.

During these periods seals are particularly sensitive to disturbance at their haul-out sites.

5.2 Mitigation and management commitments

The EMP is produced in line with the Principal Contractors ISO 14001 Environmental Management System and other relevant consent commitments and conditions.

Licence / Consent	Legislation	Granted
Section 36 Consent	Electricity Act 1989	09/10/2013
Marine Licence (licence number 04577/14/0)	Marine (Scotland) Act 2010	31/01/2014
Decommissioning Programme	Energy Act 2005	Submitted

The key commitments and conditions in place for management of potential impacts on marine mammals from the MeyGen consents, licences and ES are detailed in Table 1 below.

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	Condition, or commitment
s36	The monitoring set out in the PEMP or, as the case may be, an amended PEMP, (which must be agreed by the Scottish Ministers, in consultation with SNH and any other ecological, or such other advisors as required at the discretion of the Scottish Ministers), must be implemented by the Company. The Company must submit written reports of such monitoring to the Scottish Ministers at timescales to be determined by the Advisory Group. In particular, the following aspects should be considered and advice provided regarding the monitoring of the following aspects: a) Hydro dynamics / benthic surveys, export cable route and turbine locations and modelling to validate EIA predictions; b) Collision / encounter interactions with the tidal turbines for diving birds, marine mammals and fish of conservation concern; c) Disturbance and displacement of birds, marine mammals and basking sharks during construction and operation. This must also link to the species protection plan for seals at haul outs; and d) Migratory salmonids

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
	Subject to any legal restrictions regarding the treatment of the information, the results must be made publicly available by the Scottish Ministers, or by such other party appointed at their discretion.
ML	3.2.1.7 Monitoring of marine mammals Prior to the commencement of the works the licensee must agree in writing the details of the appointment of a Marine Mammal Observer (MMO) with the licensing authority. The MMO must, as a minimum, maintain a record of any sightings of marine mammals and maintain a record of the action taken to avoid any disturbance being caused to marine mammals. The licensee must provide the licensing authority with the MMO's records no later than six months following commencement of the works, and at six monthly intervals thereafter.
ES	The principles of the JNCC guidance on protection of marine European Protected Species (EPS) from injury and disturbance (JNCC, 2010) and of relevant guidelines on minimising the risk of injury to marine mammals will be adopted as necessary (for example, reducing the duration of noise emitting activities).
ES	MeyGen commit to undertaking frequent reviews of the literature regarding spiral injuries in seals and ducted propellers and to regularly discuss advances in understanding of this topic with relevant regulatory and advisory bodies. MeyGen will apply appropriate mitigation, as deemed necessary in consultation with Marine Scotland and SNH, should vessels with ducted propellers be used, to avoid any significant impacts.
ES	All vessels associated with Project operations will comply with IMO/MCA codes for prevention of oil pollution and any vessels over 400 GT will have on board SOPEPs. All vessels associated with Project operations will carry on board oil and chemical spill mop up kits. Where possible vessels with a proven track record for operating in similar conditions will be employed. Vessel activities associated with installation, operation, routine maintenance and decommissioning will occur in suitable conditions to reduce the chance of an oil spill resulting from the influence of unfavourable weather conditions.

Table 1 Marine Mammal Commitments

5.3 Construction Works

Summaries of the Construction Works and programme are provided in Section 4 of this report, while a detailed Construction Method Statement (MEY-1A-40-HSE-F-004-CMSConstructionWorks).

Marine mammals are considered to be potentially sensitive to the following aspects of the proposed works:

- Noise (vessel / JUV);
- Disturbance (vessel / JUV presence and movement);
- Ship strike and collision with ducted propeller;
- Pollution and spillage

5.3.1 Noise (vessel / JUV)

As detailed in the ES the source levels for vessel noise are below those at which hearing damage might occur to either cetaceans or pinnipeds. This is the case even when taking into account highly conservative criteria (being 193.7dB) (e.g. proposed by Lucke *et al.*, 2009, for harbour porpoises and those put forward by the US NMFS, 1995). The levels of noise are also significantly below those that might be expected to cause aversion in either cetaceans or pinnipeds.

Because of the low levels of noise generated, mitigation measures (such as a Marine Mammal Mitigation Protocol), including the use of a dedicated Marine Mammal Observer or Passive Acoustic Monitoring to prevent injury to marine mammals through the establishment of an exclusion zone, are not appropriate and should not be required as part of this EMP.

However, a number of measures are proposed to both encourage best practice and minimise any limited (although small) potential for disturbance. These measures include:

- The spatial separation of at least 300m of the Construction Works (HDD exit) from MLWS of the nearest known sensitive areas for seals, the designated haul out site at Gills Bay (Figure), and see CMS;
- During the cable laying works, when working at the HDD exit site (the closest point to the designated haul out site) the multi-cat will use an anchor spread to maintain the position on site, minimises propulsion use and vessel movement on site;
- The CLV will hold station at least 50m away from the HDD exit when paying out the TSC to the HDD bore;
- The TSS/TTG positions are 300m from any designated haul out sites; all DP OCV vessel / JUV operations will take place in the vicinity of these locations;
- The proposed vessel / JUV transit routes from all ports to site ensure that the vessels / JUV keep an adequate separation distance from any sensitive seal haul-out sites wherever possible, see VMP;

- Training of all on site / on vessel / JUV personnel regarding the importance and sensitivity of marine mammals and their legislative protection;
- Provision of advice to staff detailing the types of activity potentially disturbing, and therefore to be avoided; and
- Maintenance of a daily marine mammal log (Appendix A) by the Principal Contractor, into which any interaction will be noted. It is important to make clear that such a log is likely to record many approaches by marine mammals to the vessels / JUV and personnel undertaking all Construction Works. Marine mammals are intelligent and naturally curious about any in water construction works, regularly approaching vessels / JUV engaged in Construction Works.

Although some of the Construction Works will be carried out during sensitive periods for seals and also during periods where there will be greater abundance of cetaceans, it is considered that there is limited potential for disturbance offence from the construction works proposed. This is primarily due to the low levels of noise generated (gravity foundations – no drilling) and the short periods required on site for the Construction Works.

For this reasons no requirement for a licence to disturb European Protected Species (in this case cetaceans) is anticipated.

5.3.2 Physical Disturbance

The presence of any vessel / JUV in the area has the potential to cause some degree of disturbance to both cetaceans and pinnipeds; however, the key receptor in terms of numbers and proximity of sites of interest will be seals. This is considered in detail below.

The proposed Construction Works have a number of characteristics that reduce their potential to disturb all marine mammals significantly. In particular these are:

- The spatial separation of at least 300m of the Construction Works (HDD exit) from MLWS of the nearest known sensitive areas for seals, the designated haul out site at Gills Bay (Figure 4), see CMS;
- During the cable laying works, when working at the HDD exit site (the closest point to the designated haul out site) the multi-cat will use an anchor spread to maintain the position on site, minimises propulsion use and vessel movement on site.
- The CLV will hold station at least 50m away from the HDD exit when paying out the TSC to the HDD bore.
- The TSS/TTG positions are, at closest 300m from any designated haul out sites; and all DP OCV / JUV operations will take place in the vicinity of these locations. When waiting for slack tide windows vessels / JUV will wait in areas where at least a 500m separation distance can be maintained from any sensitive seal haul-out sites.
- The proposed vessel / JUV transit routes from all ports to site ensure that the vessels / JUV keep an adequate separation distance from any sensitive seal haul-out sites wherever possible, see VMP;
- The short duration of the use of vessels / JUV during Construction Works;
- Work is anticipated to be as follows:

  - TSC installation will be limited to a neap tide window, with the CLV requiring approximately 6 hours for each TSC installation (HDD pull and TSC seabed lay) running continuously through tides once the operation has commenced;
  - TSS installation will be limited to a neap tide window, with each lift requiring a slack tide. Each lift will take an estimated 1-2 hours with a minimum total time of 2 days to complete a TSS installation; and
  - TTG installation will be limited to one neap tide per TTG installation (4 neap tides in total). The ARL TTG installation and connection will take three slack tide to install. Each AHH TTG will take one slack tide to deploy and a 12-hour period on station to make the TSC connection.
- The majority of operations are limited to periods around slack water, with vessels moving off DP OCV to sheltered areas outside of operations. These areas will ensure a minimum 500m distance from the nearest seal haul-out;
- Training of all on site / on vessel / JUV personnel regarding the importance and sensitivity of marine mammals and their legislative protection;
- Provision of advice to staff detailing the types of activity potentially disturbing, and therefore to be avoided; and
- Maintenance of a daily marine mammal log (Appendix A) by the Principal Contractor, into which any interaction will be noted. It is important to make clear that such a log is likely to record many approaches by marine mammals to the vessels / JUV and personnel undertaking Construction Works. Marine mammals are intelligent and naturally curious about any in water construction works, regularly approaching vessels / JUV engaged in marine works.

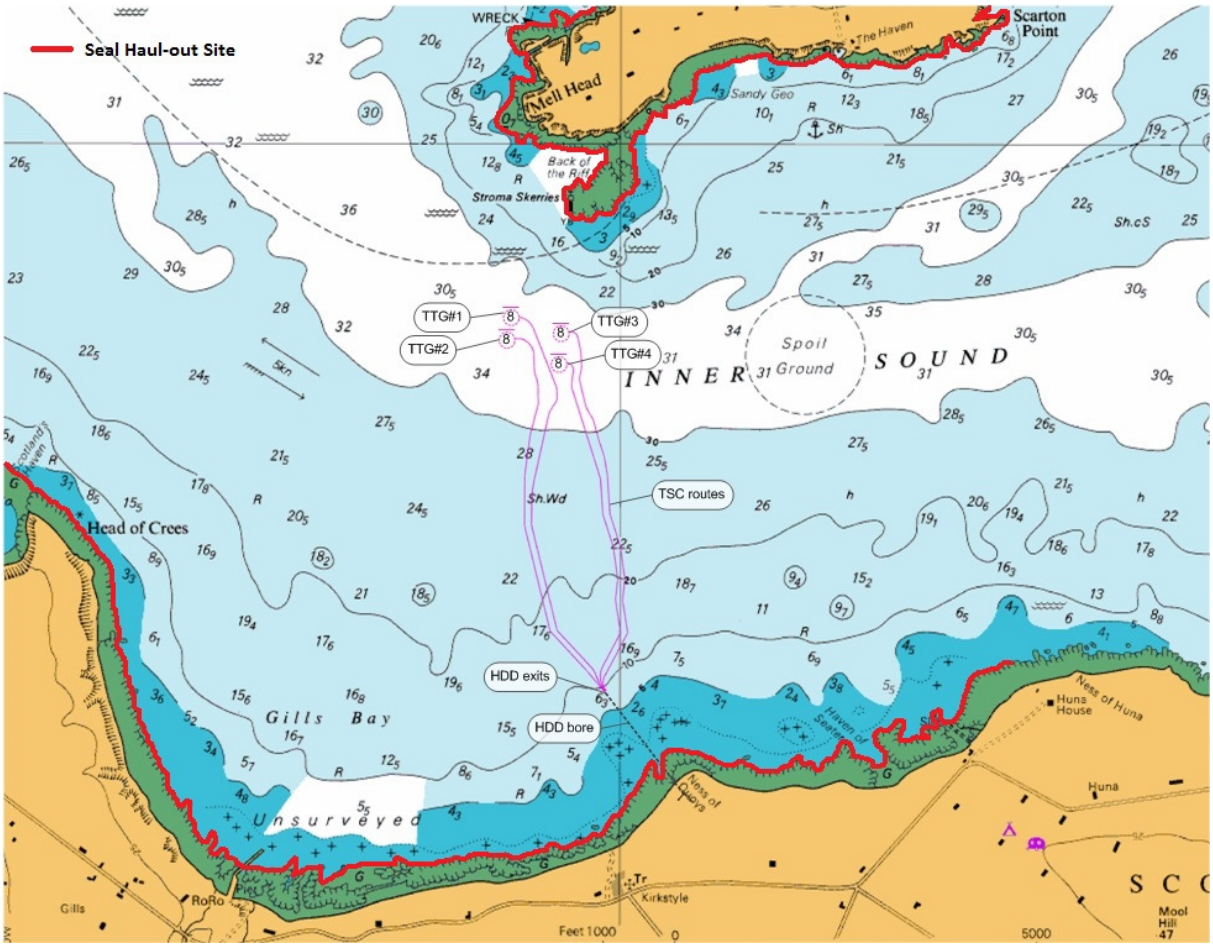

Figure 4 Location of Construction Works in relation to designated seal haul out sites

5.3.3 Ship strike and collision with ducted propeller

Multicat type vessels (vessel specification can be found in the VMP) do not used ducted propellers and for some activities when on site will use a fixed seabed anchor system, as described in detail in the CMS. This reduced the potential for both ship strike and propeller collision significantly, as vessel movement, and use of propeller position systems are both minimised.

DP OCV will be used for the main activities for the TSC, TSS and TTG installation, which are likely to use ducted propeller systems to maintain position (typical vessel specification can be found in the VMP). JUVs (which may also be used as well as DP OCV during TSS installation) also have ducted propeller systems which are used to maintain position while the JUV is fixed into place using the jacking rig.

While both cetaceans and pinniped are potentially exposed to risk of ship strike and propeller strike, there has previously been significant concern regarding the risk of corkscrew injuries to seals, initially attributed to some ducted propeller system such as a Kort nozzle or some types of Azimuth thrusters, commonly used by DP OCV. The proximity of the proposed Construction Works to areas of importance for seals (protected haul out sites at Gills Bay and Stroma), and

the numbers of individuals present meant that this was previously a key environmental concern.

Since the submission of the ES there has been ongoing research into the issue of spiral injuries in seals which has confirmed that the characteristic wounds can be caused by a seal being drawn through ducted propeller system such as a Kort nozzle or some types of Azimuth thrusters (Thompson *et al*., 2010, Bexton *et al*., 2012; Onoufriou & Thompson, 2014). To date the observed seal strandings appear to be restricted to juvenile grey seal and female harbour seal with seasonal differences evident between the species: grey seal newly weaned pups in the winter and common seal adults or pregnant females in the summer (Brownlow, 2013).

In experimental studies (Onoufriou & Thompson, 2014) it has been shown that using a combination of propeller and seal sizes, smaller seals were more likely to show the characteristic spiral lacerations; while larger seal models often became stuck in the ducted propeller system. The results of these trials and observed stranded seals suggested, at that time, that there were still a number of uncertainties as to the frequency of occurrence, and mechanisms for this type of injury.

However, bases on the most recent known research (Thompson *et al.,* 2015; van Neer *et al.,* 2015) there is now very strong evidence that predatory behaviour by grey seals, rather than ducted propeller injuries, is likely to be the main cause of spiral seal deaths. Although this evidence does not completely eliminate ship propellers, it is now considered to be unlikely that they are a key factor. The SNCBs have now provided interim advice (JNCC, 2015) on this issue, an update to the earlier (April 2012) advice, in order to clarify the agreed recommendations to regulators and industry.

This most recent advice suggests that, based on incontrovertible evidence, grey seal predation on weaned grey seal pups and young harbour seal can cause the characteristic spiral injuries that were the subject of preceding studies. The advice states that

'it is considered very likely that the use of vessels with ducted propellers may not pose any increased risk to seals over and above normal shipping activities and therefore mitigation measures and monitoring may not be necessary in this regard, although all possible care should be taken in the vicinity of major seal breeding and haul-out sites to avoid collisions'.

This new advice provides a new perspective on the preceding Statutory Nature Conservation Agency (SNCA) Guidance (2012) on the potential risk of seal corkscrew injuries, which at that time suggested levels of risk and recommendations for mitigation.

The Development is more than 60km from the nearest grey seal Special Area of Conservation (SAC, Faray and Holm of Faray), and harbour seal SAC (Sanday). The presence of the Gills Bay and Stroma haul out sites relatively close to the development site, does suggest a need for careful management of works at the site, but no direct mitigation measures are advised (SNCA, 2012).

In the light of the new, compelling scientific evidence and the revise SNCB advice, the risk of propeller collision impacts associated with the use of ducted propellers, by DP or other installation vessels (e.g. JUVs), during Construction Works is considered to be low risk.

As a consequence of the new SNCB advice, a dedicated Seal Corkscrew Injury Monitoring Scheme (SCIMS) following the SNCA (2012) guidance is not considered necessary for the Construction Works. However, a number of measures are proposed by MeyGen to encourage best practice and minimise any potential (however small) risk of vessel collisions. These measures include:

- The spatial separation of at least 300m of the Construction Works (HDD exit) from MLWS of the nearest known sensitive areas for seals, the designated haul out site at Gills Bay (Figure), see CMS;
- During the cable laying works, when working at the HDD exit site (the closest point to the designated haul out site) the multi-cat will use an anchor spread to maintain the position on site, minimises propulsion use and vessel movement on site.
- The CLV will hold station a minimum of 50m away from the HDD exit when paying out the TSC to the HDD bore.
- The TSS/TTG positions are 300m from any designated haul out sites; all DP vessel / JUV operations will take place in the vicinity of these locations. When waiting for slack tide windows DP OCV / JUV will wait in areas where a 500m separation distance can be maintained from any sensitive seal haul-out sites.
- The proposed vessel / JUV transit routes to all Construction Works ensure that the vessels keep an adequate separation distance from any sensitive seal haul-out sites wherever possible, see VMP.
- Training of all on site / on vessel / JUV personnel regarding the importance and sensitivity of marine mammals and their legislative protection;
- Provision of advice to staff detailing the types of activity potentially disturbing, and therefore to be avoided; and
- Maintenance of a daily marine mammal log (Appendix A) by the Principal Contractor, into which any interaction will be noted. It is important to make clear that such a log is likely to record many approaches by marine mammals to the vessels / JUV and personnel undertaking Construction Works. Marine mammals are intelligent and naturally curious about any in water construction works, regularly approaching vessels / /JUV engaged in Construction Works.

5.3.4 Pollution and spillage

The approach to this sensitivity is detailed in the Marine Pollution Contingency Plan (Section 6).

6 MARINE POLLUTION CONTINGENCY PLAN

6.1 Key sensitivities and associated legislation

This section identifies the potential sources of pollution events and detail the measures to prevent and respond to such events should they occur. Its objective is to minimise environmental impacts in response to an oil spill or pollution event associated with the project, as well as identifying potential risks to the environment, human health and wildlife.

The key sensitivities are:

- Water quality;
- Marine mammals; and
- Benthic / intertidal ecology.

This will also address emergency response, and will cross-reference to following documents:

- Construction Method Statement (CMS); and
- Navigational Safety Plan (NSP);

It will also set out and define roles and responsibilities in the event of an Emergency Response Plan (ERP) being initiated.

While there is no specific legislation or published guidance regarding accidental and non-routine events associated with marine renewable energy developments, the International Convention for the Prevention of Pollution from ships (MARPOL) covers pollution of the marine environment by ships from operational or accidental causes, with Regulation 37 of Annex I of MARPOL requires that all ships of 400 gross tonnage (GT) or more to have an approved Shipboard Oil Pollution Emergency Plan (SOPEP).

6.2 Mitigation and management commitments

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
ES	Minimise as far as practicable the volume of drill cuttings released into the marine environment during breakthrough of Horizontal Direction Drill (HDD) bores, by implementing a closed loop recycling system to return drill cuttings and fluid from the HDD to shore.
ES	Vessels associated with all Project operations will comply with IMO/MCA codes for prevention of oil pollution and any vessels over 400 GT will have onboard SOPEPs.
ES	Vessels associated with all Project operations will carry onboard oil and chemical spill mop up kits.
ES	Where possible vessels with a proven track record for operating in similar conditions will be employed.
ES	Vessel activities associated with installation, operation, routine maintenance and decommissioning will occur in suitable conditions to reduce the chance of an oil spill resulting from the influence of unfavourable weather conditions.
ES	Only recognised marine standard fluids and substances will be used in the pin pile drilling equipment.
ES	Consideration will be given to CIRIA guidance on the use of concrete in maritime engineering – a good practice guide.
ES	Operations will only take place during suitable weather windows.

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
ES	A fibre optic cable will be used to monitor the level of cement, when the cement reaches seabed level pumping of cement will cease immediately.
ES	During cementing operations the cement will be separated from the open sea conductor casing which is only removed once the cement has reached sufficient strength to withstand current forces.
ES	In the event of any unplanned discharges to sea during HDD activities the drilling contractor would activate its emergency response plan to ensure discharges were minimised.
ES	Only recognised marine standard fluids and substances will be used in the turbine hydraulic systems.
ES	Hydraulic fluids will be mostly water based, biodegradable and be of low aquatic toxicity.
ES	Turbine sensors will detect loss of fluid pressure and leaks enabling maintenance operatives to reduce the risk of further leaks.
S36 Condition 9	"The Company must, prior to the Commencement of the Development, submit a CMS…Pollution prevention measures including contingency plans"
ML Condition 3.1.4	If by any reason of force majeure any substance or object is deposited other than at the site which is described in this licence, then the licensee must notify the licensing authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel, vehicle or marine structure determines that it is necessary to deposit the substance or object other than at the specified site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the licensing authority is obliged to immediately report force majeure incidents to the Convention Commission.
ML Condition 3.1.8	All chemicals utilised in the drilling operations for the works must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002 (this list can be viewed/downloaded at www.cefas.co.uk). In the event that any system other that a water-based mud is considered by the licensee for use in the drilling operation then the prior written approval of the licensing authority must be obtained before such use. The licensee must comply with the terms of the guidance as to the disposal of any material arising from that operation which will be given to the licensee by the licensing authority.

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
	The licensee must ensure that any chemical agents placed within the void of any of the turbine bases including biocides and corrosion inhibitors etc. are selected from the List of Notified Chemicals. The use of any chemical not contained within this list will require prior consent from the licensing authority.
ML Condition 3.1.9	The licensee must ensure that all reasonable, appropriate and practicable steps are taken at all times to minimise damage to the Scottish marine area caused by the licensed activity authorised under this licence. The licensee must ensure that any debris or waste materials placed below the MHWS during the construction and operation of the works are removed from the site, as soon as is reasonably practicable, for disposal at a location above the MHWS approved by the Scottish Environment Protection Agency. The licensee must ensure that all substances and objects deposited during the execution of the works are inert and do not contain toxic elements which may be harmful to the marine environment, the living resources which it supports or human health. The licensee must ensure that the risk of transferring invasive non-native species to and from the site is kept to a minimum by ensuring appropriate bio-fouling management practices are implemented during the works. Any drill cuttings associated with the use of water-based drilling muds situated within the outer boundary of the works need not be removed from the seabed
ML Condition 3.2.1.3	The licensee must, no later than three months prior to the commencement of the works, submit in writing to the licensing authority for their written approval, a Marine Pollution Contingency Plan (MPCP). The MPCP must make provision in respect of spills and collision incidents occurring during the construction and operation of the works and where such spills or collisions occur then the MPCP must be adhered to in full. The MPCP must take into account existing plans for all operations, including offshore installations that may have an influence on the MPCP. Practices used to refuel vessels at sea must conform to industry standards and to relevant legislation. The MPCP must set out how any oil leaks within the turbine nacelle are to be remedied and that such relevant repairs are required to be undertaken without undue delay. Commencement of the works must not occur until the licensing authority has given its written approval to the MPCP.
ML Condition 3.2.2.1	The licensee must, on the first working day of the month, create, maintain and submit to the licensing authority a detailed transportation audit sheet for each month during which construction associated with the works takes place. The audit sheet must include information on the loading facility, vessels, equipment, shipment routes, schedules and all materials listed in the licence to be deposited (e.g. piles, pipelines, turbine components, chemicals). Where, following the submission of an audit sheet to the licensing authority, any alteration is made to the

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	Condition, or commitment
	component parts of the sheet the licensee must notify the licensing authority of the alteration as soon as practicable following the making of the alteration. If the licensee becomes aware of any materials on the audit sheet that are missing, or an accidental deposit, they shall contact the licensing authority as soon as practicable after becoming aware to advise the licensee on the appropriate remedial action. If the licensing authority is of the view that any accidental deposits associated with the construction works are present then the deposits must be removed by the licensee as soon as is practicable and at the licensee's expense.
ML Condition 3.2.2.2	In addition to the audit sheets required to be submitted to the licensing authority under condition 3.2.2.2, the licensee must, following the commencement of the works, submit audit reports to the licensing authority stating the nature and quantity of all substances and objects deposited below MHWS under the authority of the licence. Such audit reports must be submitted by the licensee at six monthly intervals, with the first such report being required to be submitted on a date no later than six months following the commencement of the works.

Table 2 Pollution Prevention Commitments

6.3 Communication - Key contacts

Organisation	Name	Role	Telephone	Mobile
MeyGen Ltd	Redacted	Reda	Redacted	Redacted
MeyGen Ltd	Redacted	Redacted	Redacted	Redacted
Maritime and Coastguard Agency	-	Redacted	Redacted	-
Marine Scotland		Redacted	Redacted	-
SEPA Hotline	-	-	Redacted	-
Health and Safety Executive	-	-	Incidents are reported online at http://www.hse.gov.uk/riddor/report.htm	

Table 3 Pollution Prevention Key Contacts

6.4 Potential Identified Risks

The following general mitigation measures will be implemented for all works, prior to the commencement of work:

- All staff will receive a site induction and tool box talk about the environmental site sensitivities and pollution prevention measures;
- The content of the Marine Pollution Contingency Plan and their responsibilities will also be conveyed to ensure that the plan is implemented effectively, should the need arise;
- Key operatives will be trained in the use of spill kits and clean up procedures in the event of an incident;
- Inventories of all chemicals and materials stored on board and being used in the construction process will be taken as part of a chemical product and waste inventory. It is not anticipated that any materials posing a major health risk are to be used on site;
- Pollution Prevention equipment will be recorded in an inventory;
- The designated Mariner Co-ordinator will be responsible for taking and maintaining the inventory; and
- All contractors will be expected to submit site specific risk assessments incorporating method statements for review and approval before works commence.

6.4.1 Construction Vessels Operations and collision

The NSP details the full navigation safety measures to be employed for the HDD Marine Works. There is limited potential for collision during these operations; however, the following measures will be implemented:

- Issue of Notice to Mariners (NtM) stating HDD Marine Works details promulgated to national and local stakeholders;
- Radio Navigation Warnings;
- Temporary Chart Markings;
- Vessel / JUV to show appropriate signals;
- Temporary structures on site marked with buoys and appropriate lighting;

6.4.2 Pollution Incidents

Two types of potential pollution incident have been identified (as defined by the Maritime and Coastguard Agency – MCA):

- Oil and chemical spills
- Objects lost overboard

<u>Oil and chemical spill</u>

In the event of a spillage sighting originating from a vessel the following actions must be taken:

- All spillage sightings must be reported to the Vessel / JUV Master immediately;
- The vessel / JUV Master must notify the Marine Rescue Coordination Centre (MRCC) identifying the location and giving an initial indication of the size of the spill (based on the 3 Tier system –see below), source of the spillage if identifiable, and other information as applicable to complete a Pollution Incident Report Form;
- MRCC will direct the onsite support vessel to the location;

- The onsite support vessel will confirm the spillage assessment based on the 3 Tier system and notify MRCC;
- The onsite support vessel will commence clean up/containment operations as applicable;
- MRCC will be responsible for completing the initial Pollution Incident Report Form which will be used to notify MCA, UKHO and other relevant authorities. Subsequent reports will be submitted on a daily basis until the spillage incident is cleared.
- The responsibility for elevating and incident classification from Tier 1 to Tier 2 lies with the MRCC;

The three tier system (small, medium and major) is used to attribute a proportionate response to spill incidents.

- Should a small scale spill occur (<1,000 litres) local, in house resources will be deployed in the clean-up.
- For a medium sized spill (1,000-150,000 litres) external assistance and resources may be utilised.
- For major spills (>150,000 litres) national level assistance and resources would be required in line with the National Contingency Plan, however, it should be noted that the scale of the works proposed for this project make a major spill unlikely.

The potential for spills is most likely to stem from construction vessels (including JUVs) which are covered by the MARPOL Convention 1978, as is pollution stemming from the unintentional loss of objects overboard. Each vessel / JUV will have its own Ship Oil Pollution Emergency Plan (SOPEP) approved by the MCA and refuelling at sea will be minimised and performed according to industry standards (there is no refuelling anticipated as part of the Construction Works).

Objects Lost Overboard

Should an unintentional loss of objects overboard from vessels / JUV occur, the GPS position of the objects lost will be logged.

Objects which constitute a possible hazard to shipping will be immediately reported to the UK Hydrographic Office (UKHO) by the Vessel / JUV Master and all objects that require recovery will be relayed to the relevant Marine Rescue Coordination Centre.

Transport Audit Sheets must be maintained and submitted in line with Marine Licence Condition 3.2.2.1.

Recovery will take place as soon as practicable.

6.5 Emergency Response Procedure (ERP)

If an emergency or pollution incident occurs the emphasis will shift to marine pollution control to minimise the discharge and to mitigate its effects. This will require the provision of products, systems or services for controlling the clean-up and minimising marine pollution, e.g. oil absorbents and booms, pollution prevention training, monitoring and clean up services.

Additionally, natural or other events (e.g. “Acts of God”) such as wind/wave conditions, flooding etc. that could create an emergency situation that must be effectively managed to minimise pollution to air, water and land would also trigger the Emergency Response Procedure.

The aims of this response procedure are:

- Primarily to ensure personnel safety and integrity of the vessels / JUV involved; and
- Secondly, to minimise potential environmental and socio-economic impacts, ensuring a fast recovery to affected resources.

Where possible, existing environmental conditions will be used to complement any response taken as part of the pre-planned actions set out in this plan. Any response would be tailored to the specific event encountered and while the broad plan sets out a range of capabilities and options, only those activities deemed appropriate to a particular situation will be employed.

Upon discovery of an incident, the allocated Responsible Person (Marine Co-ordinator) would be informed who would then make a decision on whether to implement the Emergency Response Procedure based on the seriousness of the incident. If the seriousness of the incident is in doubt, the plan will be implemented in full.

Upon initiation of the ERP the following steps would be taken:

- Stop work immediately.
- Immediately inform:
  - Redacted and
  - Redacted
- Assess the environmental and health and safety risks and issue appropriate PPE and safety equipment.to everyone on site
- Evacuate the site of all personnel not involved in the incident response.
- Review incident specific procedures for appropriate actions based upon specific of incident.
- Delegate specific tasks to site personnel involved in incident response.
- Contain the spillage if it is safe to do so, using appropriate spill kits or equipment.
- The responsible person will inform the MRCC organisation and request their involvement
- Direct emergency crews to the scene of the incident, and brief the emergency crews on actions taken up to their arrival, if applicable.
- Dispose of any clothing or clean up equipment e.g. used spill kits and absorbent material contaminated by fuel, oil or chemicals to a licensed waste management facility.
- Carry out investigation once the incident has been effectively contained and clean-up has been undertaken, to determine how and why the incident occurred.
- Details of the incident will be recorded and reported to regulators.
- Training and changes to working methods will be implemented in light of the incident investigation to ensure it does not happen again.

6.6 Incident Specific Responses

6.6.1 Fuel/oil spills into the Pentland Firth

The following procedures are proposed:

- If a spillage occurs into the water environment, the safety boat will be immediately deployed.
- All works in the area will cease immediately.
- The flow of fuel/oil will be stemmed or stopped at the source, where possible.
- The area surrounding the incident will be evacuated of all boats.
- Depending on the level of spill (3 tier system) the appropriate level of response will be initiated.
- If possible in a tidal environment, absorbent booms will be used to soak up fuel.
- Any materials used in the spill clean-up will be disposed of to a licensed waste management facility once they are no longer required.
- A report will be sent to regulator in all instances.

For incidents that occur outside normal working hours, when there is work being carried out on the site, the incident response plan identified above will be implemented by the Responsible Person, or their delegate.

6.6.2 Chemical release to water

- Work will be stopped immediately.
- The chemical will be identified and the COSHH sheet and inventory referred to for potential impacts.
- The flow of chemicals will be stemmed.
- The spill will be contained, where possible, and depending on the level of the release the appropriate organisations will be called immediately.
- All contaminated material should be removed off site as soon as possible and disposed of to a licensed waste management facility.
- A report will be sent to MCA and MS in all instances.

For incidents that occur outside normal working hours, when there is work being carried out on the site, the incident response plan identified above will be implemented by the Responsible Person, or their delegate.

6.7 Incident Records

Details of the incident and the measures that have been taken to deal with the incident will be recorded. In the aftermath of any incident, Marine Scotland and MCA will be briefed and any third parties affected by the incident will also be included in discussions.

6.7.1 Audits and Investigation

In the event of an incident, a full investigation will be conducted by MeyGen, determining

causes and responsible parties, as well as assisting in the implementation of any further mitigation measures which can be implemented on site to ensure that no further incidents occur. Findings of incident investigations will be made available to MS, SEPA, SNH and the MCA and the Health and Safety Executive as necessary.

The investigation will identify why the incident occurred and how it happened. The investigation will primarily identify how the spillage occurred, and ascertain whether it was a breach of control measures, poor management, inadequate control measures, or a result of forces outside of the contractor's control. The source of the spill will be identified, and interviews will be held with relevant plant operators, Site supervisors and sub contractor's supervisors.

All site control measures will be reviewed, including monitoring of fuel storage, COSSH assessments, daily plant inspection sheets, along with adequacy of spill kits, and oil booms.

Training in the use of spill kits will be reviewed, along with site operative's knowledge of emergency procedures. Response and containment measures will also be reviewed.

Preventative and reactive control measures will be thoroughly examined and compared with latest SEPA pollution prevention guidelines. This Emergency Response Plan will also be subject to review, with any additional measures deemed necessary incorporated with immediate effect into the plan under consultation with the regulators.

This investigation will be used to inform changes to site practice to ensure that it does not happen again. Further training of all staff will be undertaken to ensure that they are all aware of what to do and what their roles are responsibilities are in relation to pollution prevention.

7 INVASIVE NON-NATIVE SPECIES MANAGEMENT

7.1 Key sensitivities and associated legislation

The potential for the introduction of non-native marine species is dependent upon the history and movement of the vessels / JUV and equipment used.

There are two main potential routes for introduction of non-native species to the area around the project, by the Construction Works:

- Introduction of ballast water and / or sediment, containing non-native species; and
- Installation of structures, fouled with non-native species.

The implications of an introduction of an invasive species can be catastrophic depending on the species and the ability of the species to out-compete the native species and to interrupt the natural ecosystem dynamics. Within the UK, known effects are so far limited but have the potential to increase with increasing volumes of traffic. There are already invasive species occurring in ports in the UK but few records of species reaching pest levels. Concerns arise around the increase in volume of shipping predicted globally which will also increase the risk of species invasions.

The International Convention for the Control and Management of Ship's Ballast Water and

Sediments was adopted at the International Maritime Organisation in 2004, with the aim of reducing or eliminating the risk of transportation of invasive species around the world. The Convention will enter into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage. The current status of the Convention is that 40 States have signed up which represents 30.25% of world tonnage (as of 28/07/14). Therefore, although compliance is not legally required at this time UK vessels are being encouraged to comply.

The Convention will require all ships to implement a Ballast Water and Sediment Management Plan.

The potential for the introduction of non-native species at epibiota on the outside of structures is also significant and there are a number of examples of this form of transfer of non-native species from the UK and internationally. A well reported UK example is the arrival of the invasive carpet sea squirt *Didemnum vexillum* in the UK and its subsequent transfer to a number of locations by vessel movement,

7.2 Mitigation and management commitments

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	**Condition, or commitment**
ES	All vessels involved in all stages of the project will adhere to all relevant guidance (including the IMO guidelines) regarding ballast water and transfer on non-native marine species
ML Condition 3.1.9	The licensee must ensure that the risk of transferring invasive non-native species to and from the site is kept to a minimum by ensuring appropriate bio-fouling management practices are implemented during the works.

Table 4 Non-native species commitments

7.3 Non-native management measures

A risk assessment approach will be taken to management of the risk of introduction of non-native species.

A short non-native management report will be provided to Marine Scotland for each vessel arrival (including a JUV) on site and each phase of marine equipment / materials installation by MeyGen.

Key information detailed in each report will be:

- Source ports for vessel / JUV and ballast water uptake / or source of port for marine equipment / materials;
- Nature and purpose of materials transferred from the port;
- Amount of ballast water from each port;

- Amount of ballast to discharge;
- Conditions at source ports (i.e. any algal blooms, dredging work ongoing, known non-native species);
- Details of treatment put in place for ballast water of materials / equipment; and
- If ballast water exchange undertaken, details of where, how undertaken and volume of water exchanged.

The non-native species management report will be completed by the Marine Co-ordinator and approved by the ECoW, before submission to the licensing authority.

8 REPORTING PROTOCOL FOR THE DISCOVERY OF MARINE ARCHAEOLOGY

8.1 Key sensitivities and associated legislation

Potential impacts to marine cultural heritage were assessed in Section 16 of the ES (Marine Cultural Heritage). Mitigation measures to avoid or reduce potentially significant impacts to identified cultural heritage have resulted in a minor or negligible residual impact. There is potential, however, for damage to marine cultural heritage material that has not yet been discovered.

Geophysical survey data shows bedrock exposed on the seabed over most of the survey area with the exception of sand waves and gravel ridges to the SE and W of the Island of Stroma. This lack of sediment suggests low potential for the survival of *in situ* cultural material.

However, the identification of anomalies of potential anthropogenic origin, and possible archaeological interest, within the geophysical survey data indicates that the presence of cultural material is possible. Such material is most likely to be found within sediment traps that have formed within the many gullies and depressions that are prevalent across the site. If present, such material may be subject to direct impact during construction, potentially resulting in damage to, or destruction of, material of archaeological interest.

Historic Scotland carries the responsibilities of Scottish Ministers with regard to nationally important archaeological and built heritage matters (to the 12 nautical mile (nm) territorial limit) under the Marine (Scotland) Act 2010, complete with powers to create Marine Protected Areas (MPA) for cultural purposes. This role supports the long term spatial strategy outlined in National Planning Framework for Scotland 2 (2009), which aims to conserve and enhance Scotland's distinctive natural and cultural heritage, while Scottish Planning Policy 2010 sets out policy on how archaeological remains and discoveries should be handled.

In April 2012, Historic Scotland published a strategy for the protection, management and promotion of marine heritage (2012-2015) setting out priorities for protecting, managing and promoting Scotland's outstanding marine heritage under the Marine (Scotland) Act 2010.

8.2 Mitigation and management commitments

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	Condition, or commitment
ES	The following mitigations are proposed if practicable for archaeological sites of moderate and major impact significance within 100m of the development. • Avoidance. • ROV survey of the geophysical anomalies by Remote Operated Vehicle (ROV) in an appropriate manner by specialists in marine archaeology so they can be positively identified. • Detailed wreck survey and salvage. If the ROV survey reveals cultural heritage, plans/elevations will be made with a full photographic record prior to impact. Wrecks should be recorded in an appropriate manner by specialists in marine archaeology. Attempts will be made to retrieve and conserve representative examples of the fabric. If the feature is of high archaeological potential the strategies below may be implemented. • Intrusive archaeological assessment. This response will be implemented for all sites and wrecks with high archaeological potential and where there will be intrusive works. Intrusive assessments would ground truth geophysical survey results and assess the nature, extent and preservation of identified remains. • Full archaeological excavation. This level of mitigation may be deemed necessary as a result of evidence gathered by other levels and should be conducted by specialists in marine archaeology. Provision should be made for the examination and possible conservation of any artefacts recovered. Provision should be made for post-excavation work bringing the results together in a report of publication standard.
ES	Further documentary research and archiving. This response includes further detailed examination of unusual archival sources that would not routinely be consulted. • No recommendations are made for anomalies of low potential. This is due to them being interpreted as natural features. • A reporting protocol will be instigated for the accidental discovery of marine cultural material during development, maintenance and monitoring. • Avoidance. Should cultural material be accidentally discovered, it is proposed that the site be avoided.
ES	If it is not practicable to avoid the material a detailed wreck survey will be undertaken. If the ROV survey reveals cultural heritage, plans/elevations will be made with a full photographic record prior to impact. Wrecks will be recorded in an appropriate manner by specialists in marine archaeology. Attempts will be

Section 36 (S36), Marine Licence (ML), or Environmental Statement (ES) Commitment	Condition, or commitment
	made to retrieve and conserve representative examples of the fabric. If the feature is of high archaeological potential the strategies below may be implemented.
ES	Full archaeological excavation. This level of mitigation may be deemed necessary as a result of evidence gathered by other levels and should be conducted by specialists in marine archaeology. Provision should be made for the examination and possible conservation of any artefacts recovered. Provision should be made for post-excavation work bringing the results together in a report of publication standard.
ES	Further documentary research and archiving. This response includes further detailed examination of unusual archival sources that would not routinely be consulted.
ES	Avoid placing the turbines on the sandy substrate on the northeast corner of the proposed turbine deployment area.
S36 Condition 16	The Company must, prior to the Commencement of the Development, submit a Reporting Protocol for the discovery of marine archaeology during construction, maintenance and monitoring, in writing, to the Scottish Ministers for their approval, in consultation with Historic Scotland. The Reporting Protocol must be implemented in full by the Company.

Table 5 Marine Archaeology commitments

8.3 Reporting protocol

In order to mitigate this potential impact, a reporting protocol will be implemented to address the accidental discovery of marine cultural material during development, maintenance and monitoring.

The Offshore Renewables Protocol for Archaeological Discoveries (ORPAD) was implemented by The Crown Estate in 2010 (revised 2014) and is intended to satisfy any conditions that relate to reporting protocols included on consents administered by marine licensing authorities (The Crown Estate, 2014). Administration of the protocol is funded by The Crown Estate and supported by an Implementation Service, provided by an archaeological contractor appointed by The Crown Estate, and an Awareness Programme to provide awareness training in the workplace.

The Protocol addresses discoveries of archaeological interest made on the seabed, onboard vessels, in the inter-tidal zone or on land (The Crown Estate, 2014: 6). Discoveries may comprise archaeological objects, sites or anomalies (visual or digital signatures that are indicative of a possible object or site) encountered during the course of development, maintenance and monitoring activities.

MeyGen will implement and adhere to the terms of the ORPAD as set out in *Protocol for Archaeological Discoveries: Offshore Renewables Projects* (The Crown Estate, 2014).

In accordance with ORPAD, discoveries made by project staff will be reported to a Site Champion (Marine Co-ordinator) on the vessel / JUV or site who will then report to the ECoW, nominated by the developer to co-ordinate implementation of the Protocol. The ECoW will report discoveries to the Implementation Service. On receipt of advice from the Implementation Service, the ECoW will ensure the implementation of all recommended actions which may, for example, include conservation advice for finds, the establishment of a Temporary Exclusion Zone (TEZ), the institution of a watching brief or measures to further investigate a site or anomaly.

8.4 Reporting and Responsibilities

The ECoW is:

- Redacted (Section 3 for contact details);

The Nominated Contact will be responsible for:

- Co-ordinating reports of discoveries from Principal Contractor and ensuring that appropriate 'first aid for finds' is carried out and that initial data is recorded;
- Reporting discoveries to the Implementation Service at the earliest opportunity, and to other parties (e.g. the Receiver of Wreck) as required;
- Communicating appropriate measures to site staff as advised by the Implementation Service;
- Informing other teams engaged in potentially damaging activities in the area of the position of the discovery so that further impacts may be avoided; and
- Ensuring that measures are implemented as appropriate.

The Principal Contractor will be responsible for:

- Implementing a TEZ where the location of the discovery is known;
- Ensuring observation of the TEZ by all staff and contractors;
- Compiling Preliminary Record sheets for discoveries;
- Reporting discoveries to the Nominated Contact as soon as possible and
- Arranging for any archaeological finds to be carefully contained and protected.

All project staff will be responsible for:

- Safeguarding finds:
    - Handling with care;
    - Leaving marine growth, rust, sediment or concretion intact; and
    - Undertaking appropriate first aid measures, such as immersing waterlogged

finds in seawater in a clean, covered container.

- Undertaking initial recording:
  - Recording the positon of the discovery;
  - Photographing finds in the condition in which they were recovered; and
  - Labelling finds with a unique ID number as advised by the Implementation Service.
- Reporting discoveries immediately to the Principal Contractor (via their supervisor if appropriate).

The current provider of the Implementation Service is:

- Wessex Archaeology Ltd:
  - Redacted

MeyGen retains ultimate responsibility for the implementation of ORPAD and will ensure that all project staff, the Site Champion and the ECoW are aware of their roles and responsibilities under the terms of the Protocol. Project staff will be made available briefed on the protocol in the site induction and tool-box talks.

On reporting features of high archaeological importance, MeyGen will agree mitigation strategies with Marine Scotland.

9 WASTE MANAGEMENT

Principal Contractor Waste Management Plan can be found in Appendix B.

10 LINKAGES WITH OTHER CONDITIONS

The EMP is part of suite of consent related documents. Table 6 lists the documents and related conditions are relevant to the EMP. The Section 36 and Marine Licence can be found in Appendix C.

Con	Condition summary	Document	Responsible for Notification
S36 9	-	Construction Method Statement	
S36 10	ECoW	N/A	
S36 11	-	Environmental Management Plan	

Con	Condition summary	Document	Responsible for Notification
S36 12	-	Project Environmental Monitoring Programme	
S36 13	-	Advisory Group	
S36 14	-	Vessel Management Plan	
S36 15	-	Operations and Maintenance Plan	
S36 16	Reporting Protocol for the Discovery of Marine Archaeology	Environmental Management Plan	
S36 17	-	Navigation Safety Plan	
ML 3.1.3	Notification of Vessels	Construction Method Statement / Vessel Management Plan	ECoW
ML 3.2.1.3	Marine Pollution Contingency Plan	Environmental Management Plan	
ML 3.2.1.4	Notification of Commencement	Construction Method Statement	ECoW
ML 3.2.1.5	ECoW	N/A	
ML 3.2.1.6	Promulgation of navigation warnings	Navigation Safety Plan	
ML 3.2.1.7	Marine Mammal Observer	Environmental Management Plan	
ML 3.2.1.8	Cable Installation Plan	Construction Method Statement	
ML 3.2.1.9	Cable Protection Plan	Construction Method Statement	
ML 3.2.2.1	Transport Audit Sheets	Construction Method Statement	ECoW
ML 3.2.2.2	Notification of Deposits	Construction Method Statement	ECoW

Table 6 Linkages with other conditions

11 EMP REVIEW AND CONSULTATION

Under Condition 11 of the Section 36 the EMP will be reviewed and commented on by the licensing authority, SNH, and other such advisors that may be required at the discretion of the Scottish Ministers. The EMP must be approved by the licensing authority.

The EMP will be submitted to the licensing authority for distribution to the stakeholders and for approval.

Any changes the EMP deemed necessary (working methods or procedures) must be reviewed and approved by the ECoW, before it is submitted for approval to the licensing authority (Figure 5).

Version control will be conducted by the revision review block on the front page of the EMP.

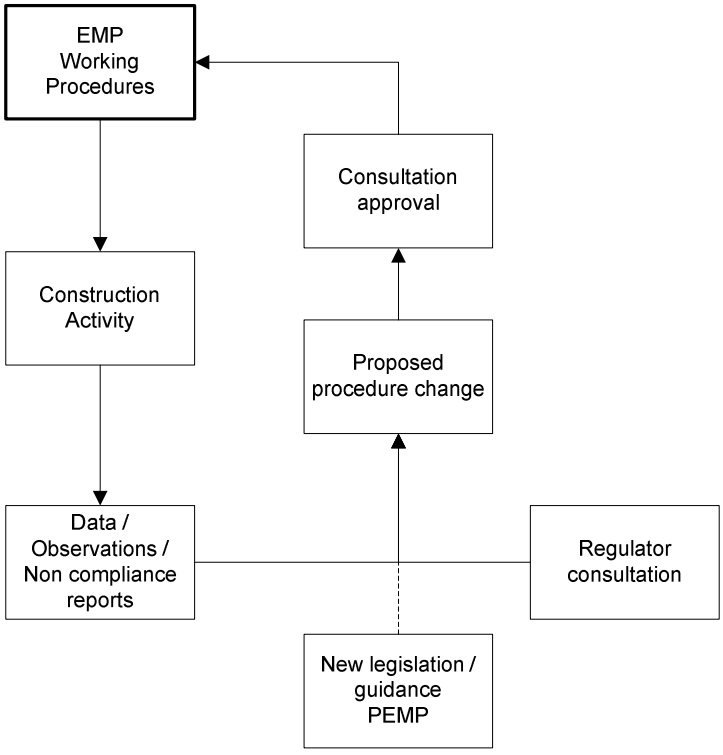

Figure 5 EMP Change Process

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13 LIST OF ABBREVIATIONS

Abbreviation	
ARL	Atlantis Resources Limited
AHH	Andritz Hammerfest Hydro
CDM	Construction (Design and Management) Regulations 2007
CLV	Cable Laying Vessel
CMS	Construction Method Statement
COSHH	Control of Substance Hazardous to Health
DP OCV	Dynamic Positioning Offshore Construction Vessel
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERCoP	Emergency Response Co-operation Plan
ERP	Emergency Response Procedures
EPS	European Protected Species
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
IOSH	Institute of Occupational Safety and Health
JNCC	Joint Nature Conservation Committee
JUV	Jack-Up Vessel
NSP	Navigation Safety Plan
MCA	Maritime and Coastguard Agency

MHWS	Mean High Water Springs
ML	Marine Licence under the Marine (Sotland) Act 2010
MLWS	Mean Low Water Springs
MMO	Marine Mammal Observer
PC	Principal Contractor
PEMP	Project Environmental Monitoring Programme
RAMS	Risk Assessments and Method Statements
SAC	Special Area of Conservation
SCIMS	Seal Corkscrew Injury Monitoring Scheme
SEIS	Supplementary Environmental Information Statement
SEPA	Scottish Environment Protection Agency
SHESQ	Safety, Health, Environment, Security and Quality
SNCA	Statutory Nature Conservation Agency
SNH	Scottish Natural Heritage
SPA	Special Protected Area
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
S36	Section 36 of the Electricity Act 1989
TSC	Turbine Submarine Cable
TSS	Turbine Support Structure
TTG	Tidal Turbine Generator
VMP	Vessel Management Plan

APPENDIX A: MARINE MAMMAL REPORTING LOG

MARINE MAMMAL RECORDING FORM										
Vessel				Client						
Contractor				Observer						
Date	Time	Position Lat / Long	Phase of Work P Pre-Operation O Operation D Demobilising	Vessel Activity Transit / on DP	Wind Beaufort / Direction	Sea State G Glassy S Slight C Choppy R Rough	Visibility P Poor (<1km) M Moderate (1-5km) G Good (>5km)	Species	Number Adults / Juveniles	Behaviour Stationary / Travelling (Direction)

APPENDIX B: WASTE MANAGEMENT PLAN (FSH-1A-40-HSE-004-D-WASTEMANAGEMENTPLAN-MEYGEN.PDF)

APPENDIX D: SECTION 36 AND MARINE LICENCE