

APPENDIX A2-4

Outline Construction and Environmental Management Plan (OCEMP)

Shannon LNG Limited
August 2021

Shannon Technology and Energy Park
Environmental Impact Assessment Report

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

PROJECT: Shannon Technology and Energy Park (STEP)
LOCATION: Ralappane, Ballylongford, Co. Kerry
CLIENT: Shannon LNG Limited
CONTRACT NO: TBC **PLAN PREPARED BY:**
START DATE: TBC **COMPLETION DATE:** TBC

Schedule OF REVISIONS

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1. INTRODUCTION

1.1 Purpose and Scope

The purpose of this site-specific Outline Construction Environmental Management Plan (CEMP) is to set out the high-level approach to the management of environmental mitigation measures required during the Construction Stage to minimise or mitigate any impact of construction works on the environment. It has been developed on behalf of Shannon LNG Limited to accompany the planning application to An Bord Pleanála (ABP). This will act as the overarching document ensuring environmental compliance for the development. A detailed CEMP will be prepared by the Main Contractor appointed to undertake the works prior to the commencement on site. The Main Contractor will ensure that the construction works are undertaken in accordance with best practice, the relevant legislation, any conditions imposed in the planning permission for the site and with minimal impact on the environment. This plan does not address the operational phase of the proposed facility.

It is intended that this Outline CEMP and its supporting documentation will address all environmental criteria associated with the works.

1.2 Content of this document

This Outline CEMP provides an overview of the environmental management of the project and identifies the key roles and responsibilities that will ensure the works are carried out in compliance with the Planning Permission and EIAR.

The document also describes the Communication, Training & Awareness programmes associated with the construction works.

All of the information is presented in a comprehensive plan including all figures and mapping required to meet environmental requirements. The documentation has been prepared to allow for ease of update as part of the ongoing review and update of the CEMP. The document is set out in the following structure:

- Section 1: Introduction
- Section 2: Project Details for the Construction Works
- Section 3: Environmental Objectives and Targets
- Section 4: Environmental Responsibilities and Organisation
- Section 5: Non-Conformance, Corrective and Prevention Action Plan
- Section 6: Communications
- Section 7: Training and Awareness
- Section 8: Waste Management Plan
- Section 9: Prescribed Environmental Aspects, Impacts and Mitigation.

1.3 Supporting environmental documentation

The CEMP is supported by a number of documents:

- Environmental Impact Assessment Report (EIAR)

1.3.1 Guidance Documents

The following guidelines and documents have been consulted to draw up general and specific construction management measures:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for Consultants and Contractors (C532). CIRIA;
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- Construction Industry Guidelines (such as CIRIA C502 Environmental Good Practice on site);
 - BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise and BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part2: Vibration (together referred to as B.S. 5228);
 - Control of Dust from Construction and Demolition Activities (BRE 2003);
 - Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Water (IFI, 2016);
 - Environment Agency (2013) The Knotweed Code of Practice. Managing Japanese knotweed on Development Sites (Version 3);
 - E. Murnane, A. Heap and A. Swain. (2006) Control of Water Pollution from Linear Construction Projects. Technical Guidance (C648). CIRIA;
 - E. Murnane et al., (2006) Control of Water Pollution from Linear Construction Projects. Site Guide (C649). CIRIA;
 - Murnane et al (2002) Control of Water Pollution from Construction Sites - Guide to Good Practice. SP156;
 - IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, Dublin
 - Site Procedure 6 (Above-Ground Oil Storage Tanks) from CIRIA C532 Control of Water Pollution from Construction Sites;
 - Pollution Prevention Guidelines No.2 (Above Ground Oil Storage Tanks) from the UK Environment Agency;
 - Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA, 2008a);
 - Guidelines for the Treatment of Otters during the Construction of National Road Schemes (NRA, 2008b); and
 - Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010, Rev. 1.).
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2. PROJECT DETAILS

2.1 Site location and Construction Works

This Outline CEMP is being produced to accompany the combined LNG Terminal & Power Plant planning application being sought on the Shannon Land Bank, approx. 4km west of Tarbert, Co. Kerry (See Figure 2.1 below) to include the following;

The Proposed Development consists of two main components:

1. Power Plant; and
2. LNG Terminal.

The proposed Power Plant will comprise of:

- Three (3) blocks of Combined Cycle Gas Turbines (CCGT), each block with a capacity of approximately 200 megawatts (MW) for a total installed capacity of up to 600 MW;
- Battery Energy Storage System (BESS);
- High voltage 220 kV Substation;
- Auxiliary Boiler;
- Raw water treatment building;
- Firewater storage tanks and fire water pumps;
- Fuel storage; and
- Ancillary buildings common to both the Power Plant and LNG Terminal.

The proposed LNG Terminal will comprise of:

- An LNG ship in the form of a Floating Storage and Regasification Unit (FSRU), with LNG storage capacity of approximately 170,000 m³ (up to 180,000 m³). The EIAR considers a capacity of up to 180,000 m³. The FSRU is a ship that can store liquefied natural gas (LNG) onboard, and which also is fitted with an onboard regasification unit which can return stored LNG into a gaseous state. The ship will be up to 300 m long, and up to 50 m wide and the height of the vessel including the top of the exhaust stack will be approximately 50 m above sea level. The FSRU will be an existing suitably classified marine vessel that will be modified to ensure it operates in accordance with the terms of the Planning Permission, the Industrial Emissions Licence and all the other relevant statutory approvals required for its operation.
 - A jetty with an access trestle, with the jetty comprising an unloading platform, mooring dolphins and breasting dolphins with capacity to accommodate up to four tugboats. They will facilitate safe mooring operations for the FSRU and visiting LNG carriers as required.;
 - Onshore receiving facilities including a nitrogen generation facility, a control room, a guard house, workshop and maintenance buildings, instrument air generator, backup power generators fire water system; and
 - An Above Ground Installation (AGI) to include an odourisation facility, gas heater building, chromatography, gas metering and pressure control equipment. The AGI will facilitate the export of LNG to the national gas transmission network via the already consented 26 km Shannon Pipeline.
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LNG will be delivered to the LNG Terminal by a visiting LNG Carrier (LNGC) which will be moored to the seaward side of the FSRU.



Figure 2.1 LNG Terminal & Power Plant Site Location



Figure 2.2 Site location

2.1.1 Site Access

The contractor will begin by setting out the site entrance as shown in Figure 2.3 as early as possible in the programme consistent with seasonal environmental restrictions and constraints. This operation will begin with the clearance of existing hedgerows and vegetation at the site entrance on the L1010 and progress along the route of the access road to the construction laydown area. This will be followed closely by the excavation of

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vegetation and topsoil for the access road which follows the existing ground levels and then the placement of crushed stone (to create a 6 m wide access road) to create an initial access and roadway to the construction laydown and jetty area. All topsoil will be retained onsite for future use. Topsoil will be placed in temporary stockpiles at various locations throughout the site for re-use on slopes, with any excess material placed in the vicinity of the contractor's compound (see Figure 2.3). Approximately 26,000 tonnes of imported aggregate will be delivered from local quarries along the L1010 from the Tarbert direction. Sources of material could include:

- Ardfert Quarries, Ardfert, Co. Kerry;
- O'Mahoney Quarries, Tralee, Co. Kerry;
- Roadstone, Foynes, Co. Limerick; and
- Liam Lynch, Adare, Co. Limerick.

It is anticipated that the creation of this initial access will take about 2 to 3 months. Apart from the delivery of materials, the operation will all take place within the site with personnel using mobile plant.

Traffic management measures approved by KCC and An Garda Síochána will be installed prior to the commencement of works to ensure the site access is safe for all road users.

Site preparation will commence with the establishment of safe access and temporary site roads. A perimeter fence will be erected around the site boundary. Fencing will be installed to protect the Ralappane stream. Temporary car parking and site office and other facilities will be established to support the early works which will primarily consist of earth moving. Temporary surface water drainage and silt ponds will be constructed to control runoff from the earthworks stages. Areas within the Proposed Development site, which are not to be disturbed during the construction stage, will be fenced off. The environmentally designated areas are outside the site boundary and will therefore be fenced off by the perimeter fence.

Some hedgerows, bushes and trees, and disused buildings, will also be removed during this phase.



Figure 2.3 Proposed compound location

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2.1.2 Project Description

2.1.2.1 Proposed Development

Site Preparation Works shall consist of the following;

- An extensive programme of pre-development licensed archaeological testing will be undertaken in the areas of the site which will be subject to development.
- The establishment of safe access and temporary site roads. A perimeter fence will be erected around the site boundary. Temporary car parking and site office and other facilities will be established to support the early works which will primarily consist of earth moving. Temporary surface water drainage and silt ponds will be constructed to control run-off from the earthworks stages. Areas within the site, which are not to be disturbed during the construction stage, such as the ring fort at the north eastern boundary will be fenced off. The environmentally designated areas are outside the site boundary and will therefore be fenced off by the perimeter fence.
- The overburden will be, in places, quite thin and to create the level platforms for the entire LNG and Power Plant facility, approximately 475,000m³ of overburden soils and rock will be excavated and placed as fill for both the LNG facility and the Power Plant facility. The LNG facility will be constructed to a finish grade elevation of 18m. All excavated material will be used onsite and no import of soil is expected. Excess material is anticipated to be used in the laydown area. It is expected that blasting will be required to excavate some of the rock, which cannot be removed by rock breaking equipment mounted on tracked excavators. The blasting will be carried out in a controlled manner in accordance with a pre-approved plan. The blasting would be carried out in a controlled manner to minimize the noise and ground vibrations. This is done by designing a blast pattern with a small charge in many holes drilled in to the rock at close spacing; the individual charges are then set off in a sequence using an electronic relay so that the maximum charge going off at any instant (this is referred to as the 'maximum instantaneous charge') is only the small amount of charge in any one of the holes. This causes cracks in the rock which allows the rock to be broken up further using mechanical rock breakers; the rock is then excavated using tracked excavators.
- Excess excavated material will be stockpiled for use as engineering fill, landscaping and other uses throughout the site.
- A single laydown area will be established during the earthworks and site preparation phase which will be used by the main follow-on contractors to accommodate temporary construction facilities such as site offices, parking, storage of construction materials and temporary sheds/workshops. Laydown will be constructed of excess cut material and a layer of stone will be placed over a layer of geotextile membrane as required. The laydown area will be suitably drained and any areas which will involve the storage of fuel and refuelling will have paved areas with bunding and hydrocarbon interceptors to ensure that no spillages will get into the surface water or groundwater systems. During the removal of the topsoil and placement of the stone for the laydown area precautions will be taken to minimise run-off into ditches, drains or the stream. When the construction phase is finished the temporary construction facilities will be removed and the stoned areas will be left in place. These areas may be used for future developments (such as a data centre) which would be the subject of a separate planning application and environmental impact statement.

The LNG terminal shall consist of:

- A jetty capable of receiving and providing secure berthing for a Floating Storage Regassification Unit (FSRU), with LNG storage capacity of approximately 170,000 m³ (up to 180,000 m³).
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- The jetty head will comprise an unloading platform, six mooring dolphins and four breasting dolphins. The mooring dolphin layout is based on standard industry (Oil Companies International Marine Forum) recommendations for angles of mooring lines. The overall length between outer mooring dolphins will be 400m.
- The trestle, which will connect the jetty head to the shore, will include a roadway for operational and maintenance access. The trestle will be approximately 345 metres long and comprises 23 spans of circa 15 metre length with a width of approximately 11 metres.
- Each of the dolphins will be supported by tubular steel piles. The jetty platform level has been set at +9m OD Malin Head, to be clear of extreme water levels and waves.
- The Infrastructure installed on the Jetty is:
 - Two gas unloading arms on the unloading platform.
 - A 30" (750 mm) gas pipe. The gas piping would run from the unloading arm on the platform along a pipe rack on the western side of the trestle.
 - hydraulic gangway tower to access the FSRU
 - Power Distribution Center (PDC)
 - compressed air system
 - fire system
 - lighting and CCTV security system.
- The GLAs connect to the FSRU to a 30" gas pipe also installed on the Jetty, to transfer the gas from the FSRU to the onshore receiving facility. The arms are composed of rigid pipe sections which can swivel to transfer gas from the FSRU to the gas piping to be installed on the Jetty. The top of the unloading arms would be approximately 30 metres above the deck of the jetty.
- The FSRU shall discharge into the GLAs at a pressure range from 48 to 98 Barg at flowrate up to 22.6 million Sm³/d.
- A firefighting system would be installed to provide firefighting capability at the base of the GLAs and cooling protection for the FSRU hull and equipment on the jetty. This would include:
 - fire towers on the deck, capable of providing cooling to the exposed hull area of the FSRU and surrounding area
 - fire pumps with remote and local start/stop functionality, each capable of delivering full cooling of the pierhead area and the hull of the FSRU.
- An emergency vent may be located on the jetty to relieve pressure from isolated pipework in the event of an emergency disconnect.

The LNG Terminal Onshore Facilities shall consist of:

- Nitrogen generation facility for gas blending;
 - Control room building;
 - Workshop and maintenance building;
 - Black start diesel generator;
 - Gas metering and gas regulators;
 - Guard house and parking;
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- Firewater impoundment basin;
- Wastewater treatment facility (buried);
- On site power generations;
- Instrument air generation unit;
- Fire water storage tanks (2 x 2200 m3);
- Fire water pumps;
- Emergency generators;
- Frequency convertor; and
- Onshore Emergency vent;

The Power Plant shall consist of:

- Shannon LNG is proposing a flexible Power Plant with 3 blocks of CCGT to a combined capacity of up to 600 MW.
- The combined Power Plant facility shall consist of three (3) blocks of CCGT. Each CCGT block with a capacity of up to 200 MW for a total Power Plant capacity of up to 600- MW. Each block comprises of two (2) gas turbine generators, two (2) heat recovery steam generator, a steam turbine generator, and an air cooled condenser.
- The Power Plant will be capable of continuous operation at a full load of up to 600MWe or at part load down to roughly 10-percent of the peak capacity.
- A 120 MW for 1 hour (120 MWhr) battery storage facility shall also be included in the development
- The Power Plant will generate power for its own needs the LNG Terminal, and for sale to the market via the national electricity grid exported via the 220 kV connection.

2.2 Project programme

2.2.1 Key Timelines

Subject to planning consent and other approvals an arbitrary start date of Jan 2023 is taken as a construction start date (however this is subject to change). The whole construction project is broken into 5 sections as per Table 2.2 below which gives the outline of construction period for each section.

Table 2.2 LNG Terminal & Power Plant Projected Construction Schedule

Area	Start On Site	Duration (months)	Completion	Duration From Start Date (Months)
Enabling	Jan 23	10	Oct 23	10
LNG Terminal	+6 months	12	Jun 24	18
220 kV and medium voltage (10/ 20 kV) connections	+8 months	14	Sep 24	21

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Area	Start On Site	Duration (months)	Completion	Duration From Start Date (Months)
CCGT - 2 Blocks	+9 months	21	Jun 25	30
CCGT - 1 Block	+ 11 months	18	Aug 25	32

2.2.2 Working Hours

Excluding the jetty construction works, it is anticipated that normal working hours during the construction phase will be as follows:

Start		Finish	
07:30	–	18:00	Monday to Friday
08:00	–	14:00	Saturday

It is proposed to stagger the various shift starting and ending times within the construction complex (for example civil employees 07:30 -17:00, jetty employees 07:45- 17:15, process area mechanical trades 08:00-17:30). This small stagger in shift start and ending times may lessen the impact of traffic peaking within the peak period and allow for a greater spread in traffic flow over the peak periods

The jetty construction works will operate on a 24 hrs basis, 6 days a week with maintenance works on Sundays and over approximately 15.5 months. Security arrangements will also be in place full time.

It may be necessary to work outside of these hours at certain stages of the work. Some working outside of the normal hours will be required to perform certain tasks such as mechanical and hydrostatic testing, inspection duties and commissioning. Certain construction activities may also require 24 hour working at the site. Other reasons for working outside the normal hours will include considerations of safety, weather, tides and subcontractor availability.

Every effort will be made during the detailed project execution planning to minimise the number and duration of night time activities.

Night time working will only be allowed with the advance permission of the County Council. Details of what are to be undertaken (including what type of noisy equipment and for how long) will be submitted with the application to KCC. Timelines for advance permission are to be agreed in advance with KCC.

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3. ENVIRONMENTAL OBJECTIVES AND TARGETS

1.1 Environmental objectives and targets

The objective of this outline CEMP is to ensure that the development works take place with no likely significant impact on the environment or the surrounding areas and that all environmental conditions that may be outlined as part of a future planning consent and any other consents are adhered to.

Work methodologies and approaches to minimise environmental impact have been established which are consistent with relevant Irish and European environmental guidelines and policies. It is intended that these environmental controls and works methodologies will be the focal point of the environmental management of the project and will ensure the successful environmental performance of activities during the construction of the proposed development.

Specific targets in relation to waste/ water usage/energy usage etc. are to be agreed with KCC in advance of the project.

1.2 Best Practice Guidance Notes to be Followed

All works carried out on the project shall comply with all applicable Irish and European Environmental legislation and all other applicable policies, standards, documents and procedures whether from the Planning Authority or other recognised authorities or bodies such as the National Parks and Wildlife Service (NPWS).

The proposed construction works will be managed in accordance with the appointed contractors Environmental Policy and Management System (EMS). The EMS will be compliant with international Best Practice and Standards and will include a robust assurance process. The EMS shall also be aligned to NFE's corporate Environmental Policy and (STEP) Management System.

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4. ENVIRONMENTAL RESPONSIBILITIES AND ORGANISATION

4.1 Environmental roles and responsibilities

An environmental management structure will be established for the construction works. The day to day activities involved in the construction works will be managed by the appointed contractor.

The detailed CEMP shall set out the roles and responsibilities of the principal parties involved in the construction of the proposed project. In addition, it shall outline the lines of communication between the various parties. The roles and responsibilities outlined below are indicative and will be updated upon appointment of Employer's Representatives, Designers and the Contractor.

4.2 Contractor's Site Staff

The responsibilities of the Contractor's site staff shall be outlined in the detailed CEMP; it is possible that some roles may overlap or be carried out by the same person. The staff shall generally entail a Contract Project Manager, a Health and Safety Officer, an Environmental Clerk of Works (EcOW) / Advisor, and a Public Liaison Officer.

4.3 Responsibilities to be Assigned

Key responsibilities to be assigned include:

- a) Liaison with Client's Project Manager and Supervising Engineer / Team;
- b) The implementation of the CEMP;
- c) Management of the overall Project Programme;
- d) Co-ordinating the construction teams/contractors;
- e) Implementing the Contractor's Safety and Health Plan;
- f) Liaison with the client representative staff;
- g) Production of Construction Programmes;
- h) Liaison with local stakeholders and dealing with any complaints or queries from the public;
- i) Maintaining a project diary; and
- j) Carrying out duties of Health & Safety Coordinator Construction Stage, implementing the Contractor's Safety and Health Plan and auditing and updating same as necessary.

Particularly with respect to the implementation of environmental protection measures, the following responsibilities are to be assigned:

- a) Implementing the Environmental Requirements of the CEMP and updating the CEMP as necessary;
 - b) Supervising and monitoring the implementation of mitigation measures as necessary;
 - c) Management of all environmental aspects of the construction works;
 - d) Ensuring all relevant mitigation measures are implemented as required, particularly those set out within the EIAR, the planning consent, the contract documents and the Natura Impact Statement (subject to any modifications by statutory consent);
 - e) Ensuring any monitoring requirements are implemented as required;
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- f) Reviewing monitoring results;
 - g) Training of staff in all environmental issues;
 - h) Provision of Tool Box talks to contractors / construction workers as required;
 - i) Ad hoc- Environmental Inspections;
 - j) Liaison with the client representative staff;
 - k) Auditing the construction works from an environmental viewpoint;
 - l) Maintaining regular contact and liaison with environmental specialists as appropriate;
 - m) Producing update reports on environmental compliance, if required;
 - n) Reporting to Kerry County Council on the Contractor's environmental performance
 - o) Reporting on any non-compliances, and good housekeeping;
 - p) Implementing measures for ensuring close out of non-compliances;
 - q) Overseeing implementation of the CTMP, SWMP, and the CEMP;
 - r) Carry out waste audits to ensure waste is segregated and controlled, and duty of care is followed with contractors.
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5. NON-CONFORMANCE, CORRECTIVE AND PREVENTION ACTION PLAN

Non-conformances are generally issued where there is a situation where legal or contractual limits associated with activities on the project are exceeded, or where there is an internal/external complaint associated with environmental performance.

Non-Conformance within the CEMP system occurs in a situation where essential components of the CEMP are absent or dysfunctional, or where there is insufficient control of the activities and processes to the extent that the functionality of the CEMP in terms of the policy, objectives and management programmes is compromised. Correction is the act of developing or improving where non-conformances have been identified. Prevention is the act of ensuring that non-conformance does not occur.

The CEMP and all its components must conform to the environmental policy, objectives and targets and the requirements of the ISO 14001 management standard. In the event of non-conformance with any of the above, the following must be investigated:

- Cause of the non-compliance;
- Develop a plan for correction of the non-compliance, to be agreed in advance of the contract, with KCC on reporting timelines, and close-outs;
- Determine preventive measures and ensure they are effective;
- Verify the effectiveness of the correction of the non-compliance; and
- Ensure that any procedures affected by the corrective action taken are revised accordingly.

Responsibility must be designated for the investigation, correction, mitigation and prevention of non-conformance. The Supervising Engineer will monitor and investigate non-compliances relating to environmental issues.

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6. COMMUNICATIONS

Effective communications are essential to the efficient delivery of the CEMP during the development of the project. Therefore, communications procedures shall be set up from the outset and implemented by the Contractor. The procedure will include at a minimum:

- Identification and details of the person with responsibility for managing communications and complaints.
- An outline of how and when consultation with potentially affected parties will be undertaken, and how potentially affected parties will be informed in advance of works that may have an off-site impact.
- An overview of how a complaint register will be maintained to record the following information: the name and address of any complainant; the time and date the complaint was received; a description of the complaint; the activity or activities and any associated equipment that gave rise to the complaint; the action that was taken to resolve the issues that led to the complaint; the date the complaint was resolved and documentation of complainant’s level of satisfaction with the actions to resolve the issue.
- A mechanism for notifying the relevant authority of complaints regarding environmental nuisance (particularly noise and dust) and the actions undertaken to resolve the complaint, and of any non-conformance with the CEMP that results in environmental nuisance.

6.1 Internal communications

An important part of the environmental communications is the training and awareness of project staff to ensure they are suitably informed of environmental aspects associated with the project. The training and awareness structure for project staff shall be compiled by the Contractor and agreed with the Client.

6.1.1 Internal environmental meetings

Environmental matters shall be discussed weekly during the Contractors Team meetings. These meetings shall focus on the performance of construction works with respect to the environment. Issues will also feature on the agenda of more generalised meetings such as weekly progress meetings so that environmental performance and concerns may be raised at management level.

6.1.2 Internal environmental reports

A number of routine environmental reports will also be generated throughout the Construction works process. These reports are to include as described in Table 6.1.

Table 6.1: Internal environmental reports

Report		Description
Environmental Reports	Progress	A written log of the environmental performance of construction works. The report will summarise environmental events for the period and include details on environmental incidents and complaints, environmental data such as waste and fuel, environmental monitoring details and areas of concern moving forward on the project.
Environmental Reports	Monitoring	A summary report containing the details of any environmental monitoring for the period on aspects such as water quality, dust, noise & vibration.
Environmental Reports	Incident	A summary report detailing the cause and extent of a particular environmental incident. The report will include a description of the remedial measures carried out and any recommendations following the incident to avoid future occurrence.
Environmental Reports	Audit	A written log of the findings of environmental audits carried out and the actions required to close out any non-conformances that may be raised.

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6.1.3 Internal environmental records

The Contractor shall establish, implement and maintain procedure(s) for the identification, storage, protection, retrieval, retention and transferring of records. All environmental activities and events will be logged on dedicated records. These reports are described in Table 6.2.

Table 6.2: Internal environmental records

Record Type	Details	
Environmental Inspection Record	Weekly	To be completed when carrying out routine environmental inspections.
Environmental Reports	Monitoring	Details of environmental monitoring of water quality, dust, noise & vibration.
Environmental Audit Record		To be completed when carrying out routine environmental audits.
Environmental Communication Complaints Record	/	To be completed when any notable environmental communication occurs or on receipt of an environmental complaint.
Environmental Tool Box Talk Register	Induction /	To be completed by all staff attending an environmental induction.
Environmental Record	Incident	To be completed in the event that an environmental incident occurs.
Waste Management		Details of waste volumes, contractor and destination, shall be recorded
Compliance records		Records of communications with any regulator in relation to reports, data, inspections, etc where required in relation to any licences, permits or consents.
Unscheduled communications		Any other records such as unscheduled, ad-hoc, or other relevant communications that have an environmental bearing on the project

6.1.4 Unscheduled communication

Circumstances are likely to occur during the Construction works whereby an unscheduled environmental communication may be required. Events may occur from time to time that cannot be predicted but will require immediate action. Events such as an environmental incident or complaint would be such an event. When events such as these occur an environmental record will be generated and the appropriate course of action will be followed. An unscheduled meeting or report may be required as part of the close out action.

6.2 External communications

6.2.1 Communications personnel

The Contractor will play an important part in all communications relating to the environment and will be made aware of all such communications if they are not the initial point of contact. The Contractor will be the point of contact with regulatory bodies for all queries relating to the environment.

6.2.2 Specific environmental meetings

Regulatory bodies such as KCC, National Parks and Wildlife Service (NPWS), IFI or EPA may undertake environmental site visits from time to time to monitor the implementation of the CEMP and supporting environmental documents. These site visits may involve environmental sampling at certain locations depending on the nature of the site visit.

The frequency of these visits will be at the discretion of the regulatory body concerned. The Contractor and Client Representative (where required) will accompany those in attendance and provide information as required or deal with any issues which may arise on site. Any concern raised during the site visit are to be

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noted and followed up until they are closed out. The Contractor will ensure that the visiting party have received the appropriate levels of induction and are allowed safe, escorted passage across the site.

6.2.3 Complaints Management

Maintaining open and constructive communications with potentially affected parties can help to reduce conflicts and complaints. Therefore, communications procedures shall be set up from the outset and implemented by the Contractor. The procedure will include at a minimum:

- Identification and details of the person with responsibility for managing communications and complaints.
- An outline of how and when consultation with potentially affected parties will be undertaken, and how potentially affected parties will be informed in advance of works that may have an off-site impact.
- An overview of how a complaint register will be maintained to record the following information: the name and address of any complainant; the time and date the complaint was received; a description of the complaint; the activity or activities and any associated equipment that gave rise to the complaint; the action that was taken to resolve the issues that led to the complaint; the date the complaint was resolved and documentation of complainant's level of satisfaction with the actions to resolve the issue.
- A mechanism for notifying the relevant authority of complaints regarding environmental nuisance (particularly noise and dust) and the actions undertaken to resolve the complaint, and of any non-conformance with the CEMP that results in environmental nuisance.

7. TRAINING AND AWARENESS

7.1 General environmental training and awareness

The Contractor shall be responsible for ensuring that appropriate environmental training is provided to all project personnel and that environmental awareness is continuously promoted throughout the pre-construction enabling phase of the project. Appropriate levels of environmental training and awareness will be provided on the project through the following approaches:

- Environmental Inductions
- Tool Box Talks
- Environmental Labelling and Signage
- Specific Environmental Training or Briefings
- Specific Environmental Awareness Procedure

7.2 Environmental induction

All personnel shall receive an environmental induction before commencing work on the project. The environmental induction will be tailored to suit the tasks and responsibilities of site personnel from management and supervisory level through to site operatives. All project personnel will receive an environmental induction on a scale relevant to their work activities. On completion of the induction, the inductee's will sign a form to provide a record of their attendance at the environmental induction.

During the environmental induction, the contents and requirements of the CEMP will be explained and discussed as well as any additional environmental requirements. The environmental induction will cover the following aspects as a minimum:

- Overview of the project and its key environmental aspects
- Organisational structure for the construction stage of the project and management of environmental issues
- That ALL personnel in the organisation must be aware of their personal responsibilities for environmental matters.
- That key individuals on-site have specific responsibilities to the environment.
- That the environmental induction forms the basic training on the project and that it will be followed up with further environmental training as the need arises.
- That all the relevant environmental information will be given before any job to enable the task to be carried out in an environmentally sound manner.
- That regular communication shall be made via site signage and regular toolbox talks.
- Employee responsibilities: That all employees are responsible for their acts and omissions and shall be held accountable if their actions result in environmental harm.
- Monitoring, Inspection and Auditing: That Construction works will be continuously monitored and inspected by environmental personnel and regular auditing of the works for compliance with the CEMP will be undertaken.
- Waste management: That the project culture is waste minimisation, reuse and recycling. Waste management policies for the project will be explained.
- Surface water management and spill control: That surface water management protection and spill management are very high priorities in all site based job activities.
- Control of nuisance: That noise and dust require particular control measures to minimise impact on the surrounding environment.
- Emergency response procedures: That the procedure, if safe to do so is: STOP, CONTAIN, NOTIFY in the case of an environmental emergency on-site.
- Environmental incident and near miss reporting: That environmental incident such as loss of containment must be reported immediately to the Environmental Manager and or Contracts Manager to identify the cause.

- Environmental Complaints: That a specific procedure will be in place to deal with environmental complaints and that every assistance must be provided to close out any active complaint.
- General environmental good practice: Materials management, storage, site upkeep, maintenance, handling and refuelling of plant and machinery

Following induction all personnel must familiarise themselves with their place of work and the environmental responsibilities associated with their position.

7.3 Tool Box Talks

Tool Box Talks shall be given on a regular basis throughout construction works and may often be specific to a particular activity taking place. Regular tool box talks will ensure site staff are aware of the environmental impacts associated with their work and the appropriate control measures that are required to carry out their work in compliance with the CEMP. On completion of a tool box talk, the employee will sign a form to provide a record of their attendance. Examples of some of the environmental tool box talks required during construction works will include the following;

- Archaeology / heritage
- Resource Usage
- Dust
- Spill Incident Control
- Water discharges
- Ecology (Flora & Fauna, including protected species)
- Watercourse and fisheries protection
- Invasive species
- Visual
- Noise
- Waste
- Community relations
- Energy efficiency

7.4 Environmental labelling and signs

Environmental labelling and signs will be used on site to inform personnel of key environmental requirements and restrictions pertaining to construction activities and to provide information to assist environmental good practice across the site. Examples of the types of signs and labelling include;

- Site environmental rules,
- Environmentally sensitive areas,
- Waste storage facilities/containers,
- Speed restrictions,
- Spill kits for emergency response.

The Contractor shall ensure that all necessary environmental labelling and signage are put in place.

7.5 Specific environmental training

Certain project personnel may be allocated a particular environmental responsibility such as daily visual checks on specifics such as housekeeping within waste skip segregation area, fuel storage area. Specific environmental training may be required to enable this person to carry out the specialist task designated to them.

Likewise, if it is identified that any aspect of environmental protection or monitoring requires more specialist training, the Contractor will authorise such training to go ahead such as basic visual checks that environmental monitoring equipment remains in situ, checking of batteries, etc.

Certain activities will require specific awareness to teach personnel when they shall incorporate the environmental training received into their specific work.

Suggested awareness tool box talks are:

- Water discharges/run-off – Talks to all sub-contractors on the appropriate controls when working in the vicinity of a watercourse and potential run-off from site works
- Nuisance management – Talks to sub-contractors on noise, dust and water management as required during different phases of the project.
- Sensitive neighbours – Talks to sub-contractors on noise, dust and traffic management as required during different phases of the project.
- Control of fuels and oils – Talks to relevant sub-contractors on the appropriate management and use of fuels and oils across the site.
- Waste management – Talks to all sub-contractors on the day to day on-site specific waste management controls.

8. WASTE MANAGEMENT PLAN

A Site-Specific Construction Waste Management Plan (SWMP) will be drafted and submitted to the Client by the Contractor and include any conditions imposed in the planning permission. The implementation of the Waste Management Plan will be the responsibility of the Contractor. The Contractor will be tasked with undertaking a monthly audit of site procedures and operations to ensure the Waste Management Plan is operating as per expectations. Waste will be managed by the Contractor across the site from commencement to completion. No waste will be transported to any facility without the Contractor firstly assessing all paperwork and paying an inspection visit to destination sites. The Waste Contractors will be the only recognised waste contractor to service the site. Day to day management of waste will be documented and revised routinely, as required. The Contractor will control and record all waste material that leaves site, and this data will be presented monthly and available in hard copy upon request. The Contractor will supervise all waste management from project commencement and across all areas of site.

8.1 Waste management policy

At the core of the project the approach will be the principles of the European Waste Hierarchy, refer to Figure 8.1, which prioritises the prevention, recycling and recovery of waste in preference to landfilling. This approach applies to the management of Construction and Demolition (C&D) wastes nationally.



Figure 8.1: Waste Management Hierarchy

The Waste Management Plan is required to address the following elements of the project:

- Analysis of the waste arisings /material surpluses;
- Specific waste management objectives for the project;
- Methods proposed for prevention, reuse and recycling of wastes;
- Material handling procedures; and
- Proposals for education of workforce and plan dissemination programme.

8.2 Objectives of the project

The SWMP shall meet the following requirements of the project:

- To comply with relevant policy and legislation on waste management.
- To set out a framework for the sustainable management of waste materials.
- To maximise the reuse and recovery of material generated by any demolition activities.
- To minimise the volumes of waste from the project being sent to landfill and to maximise recovery.

8.3 Overview of waste streams

The Contractor shall include the anticipated waste streams from the construction works of the LNG Terminal & Power Plant in the SWMP.

Material that is likely to be surplus to requirements and disposed of off-site may include general construction debris, scrap timber and steel, machinery oils and chemical cleaning solutions. In addition, the practice of excessive purchase of materials and equipment to allow for anticipated wastage will be avoided.

It is planned to reuse all spoil and excavated material on site. Typically, excavated material that is unsuitable for use as engineering fill will be used where possible for landscaping and other uses throughout the site thus eliminating the need for off-site disposal.

The site has historically been used for agriculture and consequently it is anticipated that no soil contamination will be encountered. In the unlikely event of any evidence of soil contamination being found during work on site, the appropriate remediation measures will be employed. Any work of this nature would be carried out in consultation with, and with the approval of the Environmental Department of Kerry County Council.

The quantities and volumes of all waste streams must be recorded through the course of the project along with disposal/recovery/reuse route of all materials.

Each of the waste streams shall be segregated and stored in appropriate containers for removal by a suitably permitted haulier. The skips will be located on suitable hard standing material in a designated location on site.

8.4 Prevention, reuse and recycling

Work will be planned to identify and implement ways to prevent, reduce, reuse and recycle waste. The following waste management hierarchy will be used, in order of preference, for management of all construction waste.

- Prevent potential waste
- Reduce/minimise waste
- Reuse materials
- Segregate for off-site recycling
- Segregate for off-site recovery

8.4.1 Waste Prevention

Preventing the generation of waste in the first place is the simplest means of managing the waste. Prevention of waste starts at design where consideration will be given to groundwork (extent of excavation required), sizing project items in line with available materials, and / or liaising with suppliers to supply purpose-made (e.g. plasterboard partition sheet size) and / or prefabricated materials. Only materials necessary for the job will be purchased – a precise product specification will be provided to the supplier to ensure that correct quantity of appropriate product is acquired. Packaging will be taken into consideration – it should be adequate, recyclable, and not excessive. An agreement will be made with the supplier company to facilitate return of excess and/or damaged product and packaging material. Important also is supplier delivery time; where possible this will be as close as practicable to the proposed usage times (e.g. just in time) to reduce the potential of on-site damage. Work packages are to be planned with waste minimisation in mind, particularly where material cutting is required (e.g. measure twice and cut once).

8.4.2 Reduction / Minimisation

Reduction of surpluses, deficits, and waste arisings is important from an economic viewpoint, and is also a key element in effective materials / waste management. Surplus materials include salvage items, aggregate, soil and stones from ground work, unnecessary purchased construction materials, damaged goods, and excess material purchased as part of a package lot. Deficits will occur where an area of the site requires filling (that is not available on site), or where an insufficient amount of construction materials are purchased. Waste will be minimised wherever possible. Good housekeeping will be used to conserve space, minimise material damage, and prevent cross contamination of waste. The entire site will be kept clean from unwanted items and be well organised. All materials will be stored in designated storage areas, with any stacking arrangements supervised by a competent person. All storage facilities will be kept secure and stable, with floors and access routes kept clear at all times.

Suitable and sufficient lighting will be provided at all work areas, storage locations and access routes. The importance of maximising salvage items and minimising working waste (such as off cut and damaged material) will be communicated to all site staff.

8.4.3 Reuse

Every effort will be made to reuse materials on site where practical.

Where reuse is not practical the material will be segregated into individual category type for recycling and/or recovery.

8.4.4 Recycle

Recyclable materials likely to arise include wood, rubble, plasterboard, metal, plastic, cardboard, glass, paper and canteen dry recyclables. These will be segregated on site for more efficient and cost-effective waste management off-site. A designated waste management contractor, to be appointed by the Contractor, for the construction phase and will look to maximise recycling to reduce quantities of waste necessitating recovery.

8.4.5 Other Recovery

Recoverable materials likely to arise include organics, hazardous materials, and the mixed waste fractions. This is to be kept to a minimum where possible.

8.4.6 Disposal

All higher options on the waste management hierarchy will be used to reduce disposal of waste.

8.5 Waste handling

The Contractor will take full responsibility for the identification, source separation, storage and dispatch of their own waste and sub-contractor waste from the site. They will also be responsible for maintaining good housekeeping standards. The Contractor will coordinate these tasks and log housekeeping inspections and communicate any issues to the Authority. In adherence to the SWMP, the Contractor may be audited by the Authority on an on-going basis in conjunction with wider environmental audits.

A designated Waste Compound area will be assigned and clearly signposted on site. It is to contain sufficient quantity of suitably sized labelled skips and bins, as well as adequate skip set-down areas for efficient exchange of skips. This compound shall be kept in a tidy state and secure at all times. A dedicated bunded area within the waste compound to be set up and used specifically for separate hazardous wastes. All leftover materials and waste will be segregated initially into working bins at or near each work area. These working bins will be transported from the work areas, where any materials fit for reuse are taken to the materials storage area, with waste being transferred to larger separate skips in the waste compound for efficient transport from site to relevant destination.

8.6 Mitigation Measures

Notwithstanding the impact from demolition and remediation waste on national waste plans and policies and national capacity being assessed as not significant, the following best practice measures would be implemented to manage the CDW produced by the Proposed Development:

- All wastes will be managed in accordance with Irish waste legislation, and in particular waste will only be transported by hauliers holding a valid collection permit, and will be transported to waste management sites which hold the necessary license, permit, certification or exemption.
- MARPOL Annex V waste (garbage) from LNG carriers or other vessels arriving from outside Ireland will be managed as International Catering Waste (ICW) and managed in accordance with the ICW license held by Shannon Foynes Port Company (current authorised disposal route is to Drehid Landfill, Co. Kildare).
- In accordance with EU, National and Irish national policy and legislation require the waste hierarchy (Figure 8.1) to will be applied to all waste arisings. Widely implemented best practice is to adopt a Site Waste Management Plan (SWMP) to reduce the amount of waste generated and follow the waste hierarchy in for far as practicable. A SWMP will be developed and implemented for the Proposed Development and will, as a minimum include the following details:

- Statutory requirements, the Applicants corporate requirements, site-wide waste policy and mitigation and monitoring measures defined within this EIAR where applicable to waste management;
 - Waste types and procedures for classification, segregation, containment, storage, transportation and disposal. This will include details on the measures to prevent impacts to the receiving environment. The Contractor will apply the principles of the 'Waste Hierarchy' (Prevention, Preparing for Re-use, Recycling, Other Recovery, Disposal) to minimise waste generation, maximise re-use of site-won materials on-site and minimise the need for disposal of waste. Where re-use is not possible onsite, alternative re-use and recycling options will be sought offsite with the final disposal option;
 - Roles and responsibilities;
 - Training requirements;
 - Waste handling procedures;
 - Waste compound maintenance measures;
 - Emergency planning and response;
 - Monitoring, reporting and document control procedures; and
 - Corrective action process.
- As part of the document control procedures, a comprehensive docketing system (including waste transfer notes) will be detailed in the SWMP. The documentation to be maintained in relation to waste material removed from the site will include the following:
 - The names of the agent(s) and the transporter(s) of the wastes;
 - The name(s) of the person(s) responsible for the ultimate treatment of the wastes;
 - The ultimate destination(s) of the wastes;
 - Written confirmation of the acceptance and treatment of the hazardous waste consignments;
 - The tonnages and List of Wastes (LoW) code for the waste materials;
 - Details of each individual consignment dispatched from the Proposed Development site;
 - Description of waste (cell number/AEC number, stockpile number or origin of waste)
 - Date and time of dispatch from the Proposed Development site
 - Name of haulage company
 - Details of contractor and haulier docket numbers
 - Vehicle registration number and driver name
 - Volume/weight of waste removed
 - Name of waste receiving facility
 - Date and time of arrival at waste receiving facility
 - Details of any rejected consignments;
 - Waste transfer forms for hazardous wastes transferred from the site (stamped at receiving facility); and
 - The transfrontier shipment of waste forms (where exported).
- The SWMP would include procedures for monitoring the overall CDW recovery rate.

8.7 Legal compliance

No waste shall leave site unless a full copy of the Waste Collection Permit and the Facility Licence/Permit has been provided to the Contractor for checking, approval and site filing. The dockets and licences are to be cross-checked prior to waste removal off-site. A log is to be held at site exit detailing each load/skip/container of waste that leaves site. Hazardous waste will not leave the site unless the appropriate Waste Transfer Form (WTF) notification procedure is in place and approved by the Contractor. Waste will not leave site destined for another state (including Northern Ireland) until the appropriate Transfrontier Shipment (TFS) documentation is in place and approved by the Contractor.

All waste legislation of which there are 32 Acts, Regulations and decisions, must be adhered with including, for example:

- Waste Management (Landfill Levy) (Amendment) Regulations 2015
- Waste Management Acts 1996 (as amended)
- Waste Management (Collection Permit) Regulations 2007 and Amendment Regulations 2008 to 2016
- Waste Management (Facility Permit and Registration) Regulations, 2007 (SI No. 821) and Amendment Regulations 2008, 2014, 2015
- Waste Management (Landfill Levy) Regulations 2015
- Waste Management (Licensing) Regulations 2004 and Amendments 2010
- Waste Management (Miscellaneous Provisions) Regulations 1998
- Waste Management (Facility Permit and Regulations) Regulations 2007 and Amendments 2008, 2014, 2015
- Waste Management (Planning) Regulations 1997
- Waste Management (Registration of Brokers and Dealers) Regulations 2008
- Waste Management (Shipment of Waste) Regulations 2007
- European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011

8.7.1 Waste Management Companies

The Contractor will ensure that the waste management company will provide a legally compliant service. The Contractor shall ensure that, in compliance with legislation, only authorised vehicles will be used to remove waste from site for prompt transport to an appropriately licensed facility for processing.

All waste management companies will ensure that:

- Persons (incl. vehicle drivers) entering construction sites hold a current Safe-Pass card.
- Vehicles used are properly maintained and in sound working order.
- Bins used are certified, free of defects, clean, and safe to use.
- Lifting gear is appropriately certified for use.
- All waste receptacles exiting the site are appropriately covered to prevent public nuisance or littering.

All waste companies are required to complete an 'Expectations Regarding Waste Removal' form detailing collection and destination of all wastes removed from site.

9. PRESCRIBED ENVIRONMENTAL ASPECTS, IMPACTS AND MITIGATION

The construction works at LNG Terminal & Power Plant may pose a risk to the environment and as such, a series of environmental mitigation measures are required to eliminate or mitigate any potential impact. The Contractor will implement these mitigation measures, which will form the basis of the planning consent. This section identifies the aspects and impacts and outlines a list mitigation measures. In addition to these measures, the Contractor is required to comply with all the mitigation measures that will be outlined within the EIA and the planning consent.

9.1 General Environmental Procedures

The following (minimum) project specific procedures will be developed and employed by the Contractor and their subcontractors for each environmental aspect while working on the project.

9.1.1 Outline of Potential Environmental Procedures

- Awareness & Training
- Environmental Emergency Response
- Record Keeping, Auditing and Monitoring
- Environmental Complaints Procedure
- Archaeology & Architecture (Heritage) Control Plan
- Protection of Biodiversity Control Plan
- Surface Water Management / Discharge Control Plan
- Environmental Emergency Response Plan
- Ground (Soil) Control Plan
- Waste Management Plan
- Visual (Maintenance & Housekeeping) Control Plan
- Noise and Vibration Management Plan
- Air Quality and Dust Minimisation Management Plan
- Resource Usage Plan
- Sensitive neighbours plan
- Landscape and Site Reinstatement Plan

These procedures are listed in this document for illustrative purposes. The Contractor, when appointed, will be responsible for developing these procedures. These procedures will form part of the detailed CEMP and will be continually updated where necessary. These procedures can only be amended by improvement with regards to environmental protection and must take cognisance of all relevant conditions of planning permission.

9.2 Mitigation – Environmental control plans

9.2.1 Archaeology & Architecture (Heritage) Control Plan

An extensive programme of pre-development licensed archaeological testing will be undertaken in the areas of the site which will be subject to development.

Full resolution of all archaeological sites and areas identified during archaeological testing within the Proposed Development boundary will be carried out at the pre-construction phase. All archaeological works (which will be agreed by the Archaeological Consultant and the NMS) will be carried out in compliance with the National Monuments Acts 1930 – 2004 (and Policy and Guidelines on Archaeological Excavation (Department of Arts, Heritage Gaeltacht and the Islands, 1999).

A suitably qualified and licensed Archaeological contractor will be appointed to carry out the archaeological fieldwork. Relevant licences will be acquired from the DoCHG/NMS and the National Museum of Ireland (NMI) for all archaeological works, which will be carried out in accordance with an Overarching Method Statement for Archaeological Works prepared by the Archaeological Consultant and agreed with the NMS. It is anticipated that all archaeological works will be completed prior to enabling works commencing on the site at the start of construction.

Site preparation will commence with the establishment of safe access and temporary site roads. A perimeter fence will be erected around the site boundary. Temporary car parking and site office and other facilities will be established to support the early works which will primarily consist of earth moving. Temporary surface water drainage and silt ponds will be constructed to control run-off from the earthworks stages. Areas within the site, which are not to be disturbed during the construction stage, such as the ring fort at the north eastern boundary will be fenced off. The environmentally designated areas are outside the site boundary and will therefore be fenced off by the perimeter fence.

It is anticipated that the archaeological mitigation programme will commence prior to the start of the main construction works pre enabling works.

During Phase 1 (prior to the enabling works as soon as access is available or during if necessary) – all archaeological sites and areas that require preservation by record will be investigated. This will also determine the scope of further mitigation works. A General Watching Brief (GWB) will be carried out for ground works, such as utility diversions, road diversions and ecology works.

In line with the recommendations for mitigation outlined in the 2008 testing report (Long and O'Malley, 2009), the following specific mitigation measures are proposed for the archaeological sites located within the Proposed Development. The site-specific CEMP will include specific measures included in the EIAR and planning permission. Control measure as a minimum will include:

No.	Control Measures
1.	Areas of excavation around the known archaeological sites and areas will include a 5 m buffer zone as a minimum between the edge of the site and any archaeological features. Should previously unknown archaeological features be identified then the excavation area will be expanded to ensure the 5 m buffer zone is maintained.
2.	It is noted that the archaeological deposits within Area 6 Post-Medieval Habitation site and Area 11 Enclosure are particularly close to the surface and are vulnerable to disturbance. a topographic survey will be carried out in advance of archaeological excavations to record potentially significant anomalies in the ground surface which could otherwise be damaged by plant moving over the area.
3.	The removal of topsoil in parts of Areas 6 Post-Medieval Habitation site and Area 11 Enclosure will be performed by mini-digger to reduce the potential of damage caused by plant tracking over the shallow archaeological features.
4.	A photographic survey and written description of CH6 Well will be carried out in advance of groundworks within the vicinity of this asset. The dismantling of the well will be carried out in an orderly fashion under the supervision of a suitably qualified archaeologist.
5.	In the event of unexpected discovery of potential archaeological material, the works will be stopped, and the Contractor will immediately advise the Employers Representatives. The Contractor will support the full recognition of, and proper excavation and recording of all archaeological soils, features, finds and deposits.
6.	If previously not recorded archaeological material is found during monitoring, then consultations must be held with a certified Archaeologist and the National Monuments Service with regard to any necessary mitigation measures. These measures may involve excavation of the archaeology.
7.	A method statement and licence application for monitoring at site will be submitted to the National Monuments Service (NMS) and the National Museum of Ireland (NMI) and the Archaeologist.

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8. In order to comply with the terms of the monitoring licence a fully illustrated report will be produced for each site, setting out the results of the monitoring works. These reports will be submitted to the NMS, the NMI and to the Archaeologists.
 9. Works will be planned and managed to prevent any damage to local structures.
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Phase 2 will take place during later enabling works and in advance of and concurrent with construction) – The GWB will be undertaken in all other areas where it is required, in particular in areas which have not been subject to previous archaeological testing. The construction of the outfall, jetty and other works on the foreshore will also be archaeologically monitored under licence by a suitably qualified and experienced maritime archaeologist.

Phase 3 – a post-excavation assessment will be undertaken in accordance with DoCHG/NMS advice, followed by an appropriate scheme of detailed analysis and reporting. Phase 3 will commence as soon as practicable following completion of the main investigative works.

9.2.2 Protection of Biodiversity Control Plan

There are a number of designated sites located in the surrounding area including the Lower River Shannon candidate Special Area of Conservation, the Ballylongford proposed Natural Heritage Area and the River Shannon and River Fergus Estuaries Special Protection Area (SPA). The Proposed Development includes the installation of a jetty and a outflow pipe that extend into the Lower River Shannon cSAC and the River Shannon and River Fergus Estuaries SPA.

Every reasonable effort will be made to ensure that any detrimental environmental effects will be minimised during the construction phase of this project. The site-specific CEMP will be prepared and implemented with the objective of keeping environmental impacts to a minimum, including mitigation measures in the EIAR and planning permission.

Measures will also include standard construction best practice used to manage the risk of potential for loss hydrocarbons such as diesel and hydraulic fluids. Careful supervision of construction operations and general construction practice will reduce the risk from impacts so that the likelihood of impacts is best described as low. The implementation of general construction practice will ensure that the likelihood of pollution in a well-equipped, maintained and managed construction site is low.

9.2.2.1 Terrestrial Flora and Fauna

There will be a direct loss of terrestrial habitats within the development area. Levels of noise and disturbance will increase during the construction period which will cause disturbance to fauna. Uncontrolled or poorly controlled runoff during works could increase levels of suspended solids within the stream, which crosses the site, and thus negatively impact on fish, macro-invertebrates and flora. Pollutants such as hydrocarbons from poorly serviced machinery could potentially reach the water course and impact on its ecological health.

All construction staff, including all sub-contracted workers, will be notified of the boundaries of the designated sites and will be made aware that no construction waste of any kind (rubble, soil, etc.) is to be deposited in these protected areas and that care must be taken with liquids or other materials to avoid spillage. Any works close to the boundary of the site and near the protected sites will require the development of a detailed method statement.

A survey for badgers will be carried out prior to the commencement of works at the site. This will ascertain if there have been any changes in the distribution of badgers within the site. If badger setts are located within the proposed development area at that time, detailed mitigation measures will be implemented.

A preconstruction survey will be conducted no more than 10-12 months in advance of construction for active otter holts or definite signs of usage. The objective of the survey will be to ensure that no new holts have been constructed since the previous survey and to specifically check for breeding holts. All stream side vegetation will be resurveyed at this time.

A small derelict building located close to the shoreline lacks the crevices and spaces which would make it suitable as roosting sites for bats and the presence of bat roosts at this location is considered highly

improbable. A survey for bats will be carried out prior to the commencement of works at the Shannon LNG site.

A visual search of the wet grassland habitat, to be removed, will be carried out in the days prior to commencement of development and any frogs will be removed to alternative wet grassland habitat elsewhere on the site under licence from the National Parks and Wildlife Service of the Department of the Environment, Heritage and Local Government.

Blasting is anticipated during site works, some rock breaking and piling will be required. A detailed method statement will be drawn up by an ecologist prior to commencement of works. The method statement will specify the need, if any, for ecological supervision.

In general, the EIAR and NIS will detail how habitats will be retained, protected and managed during the construction and ultimately in the operational phase of the development, and these shall be implemented.

9.2.2.2 Marine Flora and Fauna

The accidental release of sediment and chemical pollutants during the construction of the infrastructure for the Proposed Development may impact habitats and species immediately adjacent to, and upstream and downstream. To avoid negative environmental impacts construction best practice pollution prevention measures will be implemented.

To inform the assessment of the potential impact of the Proposed Development a series of specialist studies were conducted. These included assessments of the of impact of project discharges, underwater noise emissions, and habitats loss on aspects of the marine environment.

The studies showed that discharges from the Proposed Development, which includes wastewater effluents, biocide treated discharge waters and heated water discharge, would not result in significant environmental impacts.

During the construction phase a trenched water outfall will be constructed across the shoreline into the Shannon Estuary, which will result in the direct loss of habitats and associated fauna. In addition, the installation of the jetty piles in the seabed will result in the direct loss of habitats and associated flora and fauna. The loss of habitats and associated flora and fauna pending decommissioning and removal of the outfall and jetty pile is negligible, and will not result in significant effects.

Activities associated with the construction and operation of the LNG Terminal (e.g. pile driving, vessel noise) have the potential to impact fish and marine mammals by introducing sound into the marine environment. The most potentially impactful activity on marine mammals and fish during construction would be impact pile driving because of the potential for injury marine mammals and injury or mortality in fish, but this would be of limited duration and impacts will be mitigated in multiple ways

Impact assessments showed that while there is some indication that fish within hundreds of metres of impact pile driving could be at high risk of disturbance or even potentially experience injury from impulsive sound emission, impact piling would occur for a relatively short duration (60 min) for each pile, once per day. Thus, impact pile driving is unlikely to hinder fish migration, and for most fish, the distances within which mortality and/or mortal injuries could occur are relatively small and should not impact the overall populations if these types of effects were to take place.

Dolphins are present in the vicinity of the site. However, it is thought that the dolphins only use the site for short periods, probably while they are passing through the site. There is no evidence that the site is used as a foraging area. To mitigate potential impact to marine mammal species Shannon LNG will implement relevant impact mitigation and monitoring measures in relation to marine mammals as outlined in DAHG Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (DAHG, 2014);

- Pre-start Observation: Marine mammal observation period of 30 minutes minimum prior to start (or re-start after a break of 30 minutes) of any impact piling and any drilling;
- Start delay due to observation: a gap of at least 30 minutes required between the last observation of a marine mammal and start of operations;
- Observation zone: The observation zone is 1000 m for impact piling and 500 m for drilling (thus impact piling likely to require > 1 marine mammal observer);

- Commence in daylight only: Impact piling and drilling can only start in daylight conditions when visual monitoring can take place (i.e. when wind/wave conditions mean observation is possible: NPWS guidance recommends “sea conditions for effective visual monitoring by MMOs are WMO Sea State 4 (≈Beaufort Force 4 conditions) or less;
- Soft-start: For any source, including equipment testing, exceeding 170 dB re: 1μPa @1m an appropriate ramp-up procedure (i.e., “soft-start”) must be used. This should be a minimum of 20 minutes and no longer than 40 minutes;
- Continuity: once piling or drilling has started it can continue into darkness and does not need to stop even if marine mammals are seen in the observation zone (in fact, an MMO is not required once the sound generating activity starts though continued observation can be

In addition to the relevant mitigation measures detailed in DAHG (2014), Shannon LNG will implement the following measures;

- Piling activities: No simultaneous impact piling;
- Continuity between activities: Pile installation will require a combination of techniques including impact piling, vibratory piling and drilling requiring breaks in activity as equipment is changed. Where an activity progresses to a lower sound level activity – i.e. from impact piling to vibratory piling or drilling, and the break between activities is less than 30 minutes a new period of observation is not required and activities can be considered to be continuous;
- Additional seasonal observation for bottlenose dolphin: For any impact piling taking place during August, an additional MMO will be present at Moneypoint to undertake additional observations for mother-young dolphin pairings. There is known presence of neonatal bottlenose dolphin in the estuary between July and September, peaking in August, and though numbers are low there is potential for presence in the region of the Proposed Development. There will be full communication between the Moneypoint MMO and the construction team to ensure no impact piling commences until animals have moved away from a 1000 m radius observation zone (ensuring the full width of the estuary is observed in August);
- Mitigation measures during blasting: Whilst all blasting is land based there will be propagation of sound into the underwater environment. Thus, the standard mitigation measures for blasting will be adopted as a precautionary measure – qualified MMO, a 1000 m observation zone and an observation period of 30 minutes. As only single blasts will take place in each event (not a series) a soft-start is not included.
- Monitoring: The marine mammal monitoring programme, currently being undertaken by the Irish Whale and Dolphin Group (in the vicinity of the project using CPODs) will be continued into the construction phase for the validation of predictions (based on observations from other studies – see impact assessment) that any animals displaced from an area return after the construction activity stops.

To inform the assessment of the potential impact of the Proposed Development a series of specialist studies were conducted. These included assessments of the of impact of project discharges, underwater noise emissions, and habitats loss on aspects of the marine environment.

9.2.3 Surface Water Management / Discharge Control Plan

During the construction phase the mitigation measures will ensure that no sediment contamination, contaminated runoff or untreated wastewater will enter watercourses on or near the Proposed Development site. Drainage channels and water streams will be clearly identified onsite and shown on method statements and site plans.

Groundwater from the upgradient area to the south discharging onto the main construction site at the cut faces to the south, east and west of the 18 m platform will be intercepted by drainage at the toe of the slopes and diverted away from the active construction areas, to the extent possible. In case of impact by construction activity and machinery, this groundwater will pass through a sediment trap and oil/water separator prior to discharge under licence to the estuary via the outfall.

Temporary surface water drainage and silt ponds would be constructed to control run-off from the earthwork stages. Drains carrying high sediment load will be diverted through silt ponds, located between the construction area and the surface water outfall. Surface water runoff from working areas will not be allowed to discharge directly to the local watercourses or to the estuary. To achieve this, the drainage system and silt ponds will be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with the Construction Industry Research and Information Association (CIRIA) C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors (CIRIA, 2001). During the construction activities there will be a requirement for diverting rainwater run-off away from the construction areas, into the nearby estuary. Rainwater run-off will be treated to prevent sediment from entering the estuary. Discharge water quality targets will be agreed with Kerry County Council and included in the CEMP. Regular water inspection and sampling regimes will be put in place via the CEMP on the foreshore during construction activity onsite to monitoring compliance with the discharge conditions.

Where possible, excavations will only remain open for limited time periods to reduce groundwater ingress and water containing silt will be passed through a settlement tank/silt pond or adequate filtration system prior to discharge. Discharge consent under the CEMP will be obtained for disposal of ground water arising from pumping or such water may be disposed of as construction site runoff, having first passed through a settlement tank or filtration system, where appropriate. A discharge licence will be required for temporary construction phase storm water discharges to the estuary; operational phase discharges will be regulated under the site's IE Licence.

To minimise impact from material spillages, all oils, chemicals and waste materials will be stored within temporary bunded areas with a volume of 110% of the capacity of the largest tank/container within it. Fuel, oil and chemical filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) will be diverted for collection and disposal.

Vehicle/equipment refuelling and maintenance with hydraulic oil or lubricants will take place in bunded areas where possible. If it is not possible to bring the machine to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. Drip trays will be used to contain spillages with spill kits and hydrocarbon absorbent packs stored in vehicle cabs with operators fully trained in their use. Vehicles and equipment will not be left unattended during refuelling operations. Regular inspection and maintenance of site machinery will be included in the CEMP to minimise the likelihood of losses of hydraulic fluids or fuels to ground during the construction works.

Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from drainage systems and retained drainage channels, away from areas subject to flooding. Runoff from spoil heaps will be prevented from entering watercourses by diverting it through onsite settlement ponds and removing material as soon as possible to designated storage areas.

Culverts beneath the access road will be located at or close to the locations of existing natural flow paths to allow existing flows to continue. Lateral drainage will be within shallow geotextile and rock lined drainage channels to avoid the drainage of surrounding soils. The outer perimeter fence line will be set back from the L1010 to avoid crossing watercourses as far as possible. The outer perimeter fencing is not expected to impact surface water flow where two minor watercourses are crossed, as there will not be a requirement for this fencing to be extended below the water's surface. The inner security fence surrounding the Power plant and LNG Terminal will not cross any existing watercourse.

All watercourse crossings will be planned in accordance with applicable guidelines. No permanent watercourse diversions are proposed as part of the Proposed Development.

The access road will be designed to conduct road runoff to an engineered swale adjacent to the west side of the road. This swale will be profiled to grade continuously northward and to transfer the runoff from the access road to the sealed stormwater drainage system at the LNG Terminal and Power Plant area in the north of the Proposed Development.

Silt traps will be placed at crossing points to avoid siltation of watercourses. These will be maintained and cleaned regularly throughout the construction phase. Attention will also be paid to preventing the build-up of dirt on road surfaces, caused by lorries and other plant entering and exiting the Proposed Development site, via wheel washes and road sweepers as required.

Foul sewage arising from kitchen facilities and temporary toilets and sanitary facilities during the Construction Phase on the Proposed Development site will initially be discharged to an onsite receptacle which will be appropriately managed by the service contractor with relevant licences and emptied by tanker on a regular basis for disposal at a licenced waste facility.

It is anticipated that, due to the scale of the Proposed Development, a canteen will be provided onsite during construction. Provisions will be made for a grease trap at the canteen drain outlet and this drain will connect to the onsite receptacle and later to the WWTP. Drumming of waste cooking oil within the canteen will also be provided.

During the construction phase there is a risk of loss of hydrocarbons from vehicles and plant involved in construction activities and subsequent hydrocarbon.

The employment of good construction management practices will serve to minimise the risk of pollution of soil, storm water run-off or groundwater. The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, Control of Water Pollution from Construction Sites, guidance for consultants and contractors (Masters-Williams et al 2001). The guide is written for project promoters, design engineers and site and construction managers. It addresses the main causes of pollution of soil, groundwater and surface waters from construction sites and describes the protection measures required to prevent pollution of groundwater and surface waters and the emergency response procedures to be put in place so that any pollution, which occurs, can be remedied. The guide addresses developments on green field and potentially contaminated brown field sites.

The construction management of the site will take account of the recommendations of this document to minimise as far as possible the risk of soil, groundwater and surface water contamination.

Site activities considered in the guidance note include the following:

- excavation,
- earthmoving,
- concreting operations,
- spreading of topsoil,
- road surfacing,
- site drainage, and the control and discharge of surface water run-off from the site,
- oil and fuel delivery and storage, and
- plant maintenance

The site-specific CEMP will detail and implement specific control measure as included in the EIAR and planning permission.

General Control Measures

No.	Control Measures
1.	Training of site managers, foremen and workforce, including all subcontractors, in the pollution risks and the preventative measures
2.	Suitable and sufficient site specific risk assessment will be undertaken by a competent person, using the source-pathway-receptor model to identify the site risks
3.	Written procedures to address activities where there will be a particular risk of pollution
4.	Emergency response plan will be developed with responsibility for emergency response identified at the start of the project with spill control equipment readily available
5.	Maintaining the site clean and tidy, with proper collection and storage of waste
6.	Identify all drainage on site and use colour coding to distinguish them: blue for surface water, red for foul, and a red 'C' for combined drainage systems.
7.	Develop a site drainage plan detailing the location of identified drains, surface water flows and details of the collection strategy and any necessary treatment of surface water.

8.	Surface water runoff from excavations and exposed soil, as well as dewatering from the soft ground excavation, will be passed through a series of settlement and filtration ponds, to remove excess suspended solids, before being discharged directly to the stream.
9.	Spoil and temporary stockpiles will be positioned in locations which are distant from drainage systems and retained drainage channels, away from areas subject to flooding. Runoff from spoil heaps will be prevented from entering watercourses by interceptor drains, diverting it through onsite settlement ponds. Material will be removed as soon as possible to designated storage areas.
10.	Earthwork activities and site haul roads will be sprayed regularly with water using sprinklers and bowsers to damp down, particularly during periods of dry weather. Measures will be provided to minimise run-off into the pNHA/cSAC;
11.	Water quality monitoring of the discharge will be implemented to demonstrate effectiveness of the measures.
12.	Any proposed discharge area will avoid bare rock, and will only be located where suitable subsoils are present.
13.	No waste materials, oils, paints, other such contaminants, or any washing out of the aforementioned will be allowed into any drain, sewer or water. Oils and fuels will be stored in bunds. Drip trays / plant nappies will be in place for stationary plant.
14.	Regular maintenance, and removal from site of leaking plant or equipment, and dedicated refuelling locations for mobile plant will be set up.
15.	All drainage systems will have inspection chambers and be set up in such a manner as to facilitate effluent isolation from the discharge point, and have an alternative containment system, as may be required in the event that the discharge becomes contaminated.

Implementation of the CIRIA guide's recommendations will ensure that the risk of pollution of groundwater, soils and surface waters, resulting from the construction activities, will be minimised

9.2.4 Works in the Estuary

A significant amount of the jetty construction work will be carried out over open water. The jetty construction contractor will be required to demonstrate that working practices, construction methods and pollution prevention measures will be set in place to prevent pollution from entering the marine environment.

The jetty construction contractor will be required to liaise closely with Shannon Foynes Port Company Harbour Master & Pilotage Superintendent in relation to scheduling of activities.

Vessels required for the work (including barges, scows etc.) will be moored and anchored so as not to interfere with traffic in the navigation channel and in accordance with guidelines established by the Harbour Master and Shannon Foynes Port Company.

Potential impacts to the marine environment from raw concrete will be minimised by maximising the use of pre-cast concrete and minimising the use of in-situ concrete. Any in-situ concrete work will be staged in a manner to prevent concrete from entering the water. Concrete suitable for underwater will be used.

Piles will be prefabricated as much as possible to minimize in-water construction.

Spoil from the drilling operations will be conveyed to the surface via reverse-circulation through the drill stem and collected in designated scows or other storage vessels.

Where the outfall extends beyond the low water mark into the estuary, excavation of rock will be undertaken using an expanding grout placed by divers into drilled holes to pre-split the rock to the required levels and facilitate its removal by long reach excavator bucket. Trenches excavated across the shoreline will be backfilled with concrete suitable for underwater use and the surface will be embedded with cobbles and stone excavated from the trench to minimise the visual impact. The excavated material will be removed from the foreshore and incorporated as part of the earthworks and landscaping for the Proposed Development.

Excavated material and the spoil from installation of the entrenched outflow pipe will be removed from the foreshore and incorporated as part of the earthworks and landscaping ashore..

Section 9.2.2 describes the construction works in the estuary that will introduce sound into the marine environment. Mitigation measures to avoid environmental impacts are also detail.

Additional specific mitigation measures for work in the estuary are listed in Chapter 07A Marine Biodiversity of the EIAR and will be implemented by the Contractor.

9.2.4.1 Invasive Species

Ballast water for the FSRU and LNGC will be managed in accordance with the vessels Ballast Water Management Plan in accordance with Flag State requirements, Shannon Foynes Port Company operating procedures and the provisions of Section 34 of the Sea Pollution (Miscellaneous Provisions) Act 2006 referencing the International Convention for the Control and Management of Ships' Ballast Water and Sediments, which entered into force in September 2017.

The FSRU would initially arrive to the STEP terminal full of LNG and therefore would not be carrying ballast. Ballasting of vessels with the River Shannon is a routine practice and the FSRU would take on ballast water from the river once in operation. There is, therefore, no risk of extra marine pests being introduced to the River Shannon from FSRU ballast water. LNG carriers also would arrive full of LNG and with no ballast water. The LNGC's would take in ballast water in accordance with routine practice.

9.2.5 Environmental Emergency Response Plan

The development of an accident prevention and emergency response plan (including environmental emergencies) shall be the responsibility of the appointed Contractor and Project Supervisor for the Construction Stage (PSCS). This plan shall be appended to the detailed CEMP as an Appendix and shall include all relevant contact details. Control measures shall include as a minimum:

No.	Control Measures
1.	An Environmental Emergency Response Plan Control Plan will be agreed with the Client prior to works commencing on site. The Contractor shall appoint an emergency spill contractor.
2.	A 'Spill Incident' includes: Drips, Stains, Spillage, or Release of any liquid (including oils, soiled water, sewage, paints, resins, cement and chemicals).
3.	All materials and spill-risk activities will be restricted to the least sensitive part of site, greatest distance from surface waters, drainage, etc.
4.	All plant and equipment will be mechanically sound, and operated and maintained in accordance with the manufacturer written recommendations to prevent oil leaks.
5.	All storage tanks and the associated filling areas, and cleaning areas will be located on firm level, impervious ground. No discharge will be allowed from these areas.
6.	Designated secure lock-up bunded facilities will be provided for storage of all hazardous materials (paints, chemicals, gas...etc.). Safety data sheets for materials therein will be available in the storage unit. Onsite storage of all liquids will be kept to a minimum. All materials (hazardous and non-hazardous) will be clearly labelled. This is shown in Appendix 4 Logistics Plan.
7.	Only properly certified, self-bunded metal units will be used for storage of fuel on site.
8.	All liquid containers, static and mobile fuel units, generators and associated hoses will be contained in proper impermeable bund, or contained in spill pallet / tray. Such containment will have capacity of the greater of either: 110% of the largest container within, or 25% of the total volume of materials storage capacity within.
9.	Major plant refuelling will be done at a fixed location. Spill kit will be available during the refuelling. A designated concreted, bunded area will be used for refuelling on site and for unavoidable on site servicing and maintenance (servicing and maintenance will be carried out off-site).
10.	An authorised waste collection company will be employed to clean contents of all bund facilities as required. No such material will be released to land or drain.
11.	Fuel hoses will have a shut off valve and be locked when not in use. The oil filling facility will be such that access for oil filling can only take place with the prior notification of a designated person.
12.	All bunded facilities will be subject to routine inspection to ensure integrity.
13.	Only approved fuel containers (jerry cans) will be used to hold smaller volumes of fuel.

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14. Appropriate quantity of Spill Kit material ('oil only' booms and socks) will be retained and available near all material storage points and all drainage channels for use in the event of an environmental incident. Appropriate quantities of Spill Kit material will be available within all mobile equipment.
 15. Local dewatering and collection of groundwater during construction may require disposal. A suitable system for treatment and disposal of groundwater during construction are to be implemented following suitable pollution control and attenuation measures.
 16. The Contractor will also report on any incidents such as spills or leaks and how such incidents were dealt with to mitigate environmental impacts. These reports will be issued to the Client and mitigation measures discussed.
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9.2.5.1 Control of concrete

The management of cementitious material on site is required for the protection of transitional waters from any spillages - cement and concrete are toxic to fish. Measures must be taken during all aspects of construction to ensure that no cement or concrete is allowed to enter intertidal waters. A suitable risk assessment for wet concreting will be completed prior to works being carried out, which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil or to the marine environment. Control measure as a minimum to include:

General	
No.	Control Measures
1.	The use of concrete with a suitable drying time or appropriate protection of working areas must be used where tidal sequences result in any risk of tidal contact with newly-concreted areas
2.	A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil or to the marine environment.
3.	The pouring of concrete will take place within designated areas as required, using a geosynthetic material to prevent concrete runoff into the soil.
4.	Concrete pouring should only be done in fully-isolated shuttered locations
5.	If concrete is to be made up onsite, then a bunded area at a distance from the sea should be used for this process to minimise to the greatest extent any risk of concrete or concrete product contamination of water
6.	Concrete pours shall not be carried out during forecasted periods of heavy rainfall. Weather forecasts will be monitored during the construction phase. The 24 hour advance meteorological forecasting service from Met Éireann will be used
7.	To reduce the potential for cementitious material entering the Shannon Estuary, concrete pours will be supervised by the Construction Manager, a suitably qualified engineer and the Environmental Manager
8.	To prevent spillages to transitional waters, the surrounding areas will be isolated from the concrete works, prior to the concrete pours taking place, by installing shuttering to contain the concrete. The shuttering will stay in place until the concrete has cured.
9.	The Construction Manager, the Environmental Manager and appropriate engineer will supervise all concrete pours
10.	Works requiring discharge of water from excavations or areas of water which may have come in contact with concrete or cementitious material will require a site Permit to Pump under the CEMP. All such water will be tested for pH by contractors, and discharging water must go through a series of filtration systems before final discharge
11.	The Environmental Manager is responsible for ensuring that appropriate water pollution prevention measures are put in place and that water sampling is carried out. Where standards are breached he/she will carry out an investigation and in conjunction with the Construction Manager, he/she will ensure remedial action is taken and further samples taken to verify that the situation has returned to normal
12.	The Environmental Manager is responsible for ensuring spill kits are readily available in vulnerable locations and that booms for watercourses are long enough and have adequate anchorage.
Concrete Wash Down Water	
No.	Control Measures
1.	Pours will not take place during heavy rainfall. Weather forecasts will be monitored during the construction phase. The 24 hour advance meteorological forecasting service from Met Éireann will be used
2.	To reduce the volume of cementitious water, washout of concrete trucks will not take place onsite. Concrete trucks will be washed out off site at the source quarry
3.	To minimise the potential for water quality impacts, no wash down of concrete chutes will be permitted within 200m of the transitional water or any surface water that drains into same
4.	To reduce the volume of cementitious water, only concrete chutes will be washed down onsite. The concrete trucks will wash down their chutes at a designated chute wash down area, preferably in the site compound. The wash down area will consist of a polythene lined bunded area of adequate capacity
5.	Mixing of concrete is to be carried out within a designated bunded area within the site compound where the risk of wash out of concrete to the Shannon Estuary is eliminated. This designated chute wash down area will also be used to effectively treat concrete wash water arising from the washing out cement mixers and the cleaning of tools and equipment
6.	Wash-water from the washing out of mixers and other equipment will be undertaken off-site at the end of each day

9.2.6 Ground (Soil) Control Plan

In the event of any evidence of soil contamination being found during either the excavation or the construction works, appropriate remediation measures will be employed. Any contaminated soil will be delineated, removed and stored on impervious quarantine areas pending testing to confirm appropriate removal and disposal to permitted/licensed waste facilities. Records of disposal will be retained on site for inspection by KCC.

No.	Control Measures
7.	In the event that short term c24-48 hour storage is required the material will be retained in a designated stockpile storage area identified on the relevant site layout drawings.
8.	All excavated soils leaving the site will be recorded using a materials dispatch log detailing the date of transport, vehicle registration, quantity and type of material and destination. Its envisaged no excavated material will leave site.
9.	If contaminated ground is found to be present on a work site the project team will assess the risk in relation to: Mobilising contaminants as a result of the works and potential receptors in the local vicinity which may be impacted upon as a result.
10.	If contaminated ground cannot be avoided the project team will attempt to remediate any arising's on site or remove the contaminated soil to a quarantine area or to a soil treatment facility using a licensed waste contractor. If detailed ground investigation is then required the project team will plan for careful excavation to allow segregation of contaminated land from uncontaminated waste.

Temporary storage of soil will be carefully managed in such a way as to prevent potential negative impact on the receiving environment. Spoil and temporary stockpiles including stone stockpile areas will be positioned in locations which are distant from the shoreline, drainage systems and retained drainage channels and away from areas subject to flooding, so as not to cause potential run off to soils. The CEMP will outline proposals for the excavation and management of excavated material. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. In order to minimise the potential environmental impact of stockpiles, the CEMP will contain the following mitigation measures that will be implemented during the construction phase:

No.	Control Measures
1.	Store excavated topsoil and rock for reuse in graded stockpiles less than 2 m high to prevent damage to the soil structure. Other excavated materials of lower engineering quality can be stored in higher piles. The depth of topsoil removal across the site is expected to be 0.15 m and, in total, 35,000 m ³ of topsoil is expected to be removed, stockpiled and reused on site during the proposed development works;
2.	Of this 35,000 m ³ of topsoil, 13,745m ³ is expected to be used as backfill and the remaining 21,255 m ³ will be used to cover the lay down area on completion of constructions and also used in landscaping or to form berms.
3.	To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff;
4.	Manage potential silty runoff from stockpiles and excavated area using silt fences and silt traps placed at crossing points to avoid siltation of watercourses on and close to the Proposed Development site. These will be maintained and cleaned regularly throughout the construction phase. Attention will also be paid to preventing the build-up of dirt on road surfaces, caused by lorries and other plant entering and exiting the Proposed Development site.
5.	Segregate different grades of soil where they arise and topsoil will first be stripped from any land to be used for storing subsoil; and
6.	Minimise movements of materials within the stockpiles in order to reduce the degradation of the soil structure
7.	Maintain an even inclined surface on cut and fill surfaces to prevent the formation of ruts and hollows (which may promote ponding);
8.	Defer final shaping and trimming of formation levels until immediately prior to placement of surface dressing;
9.	Undertake earthworks in glacial till in times of dry weather, where possible; and
10.	Manage groundwater and surface water flows through drainage channels. Channels to be regularly inspected to prevent build-up of debris and sediment, particularly at crossing points, fence crossings and where the minor watercourses enter and leave the proposed development site.

9.2.7 Waste (Reduction & Management) Control Plan

A detailed SWMP will be prepared prior to the commencement of the works once a Main Contractor is appointed to undertake the works and will ensure that the waste generated is managed in accordance with best practice, the relevant legislation and with minimal impact on the environment.

The Contractor will be required to develop, implement and maintain a Waste Management Plan during the construction works. A senior manager will be responsible for the waste management plan. He will be

competent in waste management, and will receive training, where necessary, such as the CIF/FÁS Construction and Demolition Waste Management module.

Control measures are to include:

No.	Control Measures
1.	<p>In order to comply with the Waste Management Plan in accordance with the provisions of “Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (Department of the Environment, Heritage and Local Government, July 2006)” the contractor will submit a detailed SWMP to the Client and if required to KCC if a requirement of planning permission.</p> <p>The Contractor will ensure the SWMP will include:</p> <ul style="list-style-type: none">- planning,- prevention,- management,- duty of care, and- tracking of all project waste.
2.	<p>Construction will be planned to identify and implement ways to prevent, reduce, reuse and recycle waste. The following hierarchy will be used, in order of preference, for management of all construction waste.</p> <ul style="list-style-type: none">- Prevent potential waste- Reduce/minimise waste- Reuse and/or recycle materials- Segregate for offsite recycling- Segregate for offsite recovery- Segregate for offsite disposal
3.	<p>Prior to appointment of any waste management contractor or waste facility all necessary documentation such as waste collection permits, waste facility permits, and waste licences will be forwarded to the Contractor for review and approval. Compliant waste management contractors with maximum recycling rates and reduced volumes of waste to landfill rates will be given preference. Audits/site inspection will be carried out by the Environmental Manager, or nominated deputy, of the chosen waste facilities before any waste goes there. This applies to all waste types.</p>
4.	<p>A designated Materials / Waste Compound area will be assigned and clearly signposted on site. This compound will be kept in a tidy state and secure at all times. All leftover materials and waste will be segregated initially into working bins at or near each work area. These working bins will be transported from the work areas, where any materials fit for reuse are taken to the materials storage area, with waste being transferred to larger separate skips for efficient segregation and transport away from site.</p>
5.	<p>A dedicated banded area within the materials / waste compound will be set up and used specifically for separate hazardous wastes. All bins therein will be well labelled to identify dedicated waste type.</p>
6.	<p>Working skips will be moved appropriately as the project progresses and different types of recyclables arise in order to maximise recycling. All skips will be well labelled to identify dedicated waste type, and suitably positioned to facilitate waste vehicle access.</p>
7.	<p>Work will be planned with waste minimisation in mind. Ordering, sizing, and storage of materials is important to reduce unsuitable product, excess packaging, offcuts and damaged materials.</p>
8.	<p>Waste will not leave site unless a full copy of the Waste Collection Permit and the Facility Licence/Permit has been provided to the Environmental Manager for checking, approval and site filing. The dockets and licences will be cross-checked prior to waste removal off-site. Hazardous waste will not leave the site unless the appropriate Waste Transfer Form (WTF) notification procedure is in place.</p>

9.2.8 Visual (Maintenance & Housekeeping) Control Plan

The following are some of the measures that will be taken to ensure that the site and surroundings are maintained to a high standard of cleanliness:

No.	Control Measures
1.	Parking will be only permitted at designated areas. The Contractor will provide adequate, bicycle and car parking facilities within the Contractors Compound for site workers during construction.
2.	The entire site including all site offices, accommodation and storage facilities will be maintained in a safe, clean and organised condition throughout the project.
3.	A regular program of site tidying will be established to ensure a safe and orderly site
4.	Access and exit routes will be kept clear at all times.
5.	All site users will be briefed on the importance of using site bins to ensure that the site and surrounding areas are not littered. The site will be furnished with sufficient bins that are serviced regularly.
6.	Scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind,
7.	Food waste will be strictly controlled on all parts of the site,
8.	Loaded lorries and skips will be covered with plastic sheeting and tied down
9.	Internal haul roads will be paved at the earliest possible opportunity and inspected regularly for cleanliness.
10.	Surrounding roads used by trucks to access to and egress from the site will be cleaned regularly using an approved mechanical road sweeper. Roads will be cleaned subject to local authority requirements. Site roads will be cleaned on a daily basis, or more regularly, as required.
11.	Road edges and footpaths will be cleaned using a hand broom with controlled damping.
12.	Wheel wash facilities will be provided with rumble grids to remove excess mud from wheels. These facilities will be located at all exits from the site and away from sensitive receptors and the pNHA/cSAC.
13.	In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed-off in the normal manner
14.	A designated secure lock-up facility will be provided for storage of tools, plant and equipment during times that they are not in use.
15.	Keys for mobile plant and equipment will be retained in a secure location during times that they are not in use.
16.	Onsite storage of all liquids will be kept to a minimum. Designated secure lock-up bunded facilities will be provided for storage of all liquid materials (paints, chemicals, gas...etc.). Material safety data sheets and contact details of person responsible for materials therein will be available in the storage unit. All materials (hazardous and non-hazardous) will be clearly labelled.
17.	All site areas will be appropriately designated and clearly signposted (materials storage, waste compound area, etc.).
18.	Only good quality signage will be posted. These will be replaced as deemed necessary by the Contractor.
19.	All temporary structures, fencing, hoarding, bunds, refuelling and fuel storage facility, haul roads, drainage, waste compound area, site security, access control systems, and extra materials will be removed prior to handover of the finished project. All these areas will be reinstated as may be required.
20.	Respectable and safe standards of dress and conduct will be maintained at all times. Management and staff will be courteous in dealing with others, both on and off site. Pride in the management and appearance of the project and the surrounding environment will be shown at all times.

Shannon LNG undertakes to promptly repair any damage to property or services attributable to construction activity and will maintain a dedicated contact point in this regard

9.2.9 Air Quality Control Plan

Construction dust emissions will be controlled via the CEMP. Emissions to air during the earthmoving and construction phases will occur, although the prevailing weather, the size of the site and its distance to sensitive receptors will assist in facilitating the management of any effects. The focus of the control procedures will therefore be to reduce the generation of airborne material.

A community liaison officer will be appointed by Shannon LNG to immediately address any complaints from the public relating to environmental and safety matters.

Dust emissions are likely to arise from the following activities during the construction works:

- Site earthworks;
- Wind blow from temporary stockpiles;
- Handling of construction materials;
- Landscaping; and
- Construction traffic movements.

Good practice site procedures will be adopted to limit dust at the construction site itself and to minimise potential for secondary impacts due to dust and other material, e.g., mud being transported onto the surrounding road network. The degree of active control measures necessary to be adopted at the subject site will depend on the time of year and the weather conditions prevalent at that time. The following 'good practice' measures will be adopted:

No.	Control Measures
1.	The site-specific dust minimisation control plan will take account of all construction activities by adhering to the Building Research Establishment Document Control of Dust from Construction and Demolition Activities. This control plan shall take into account the type of construction activity being carried out in conjunction with but not limited to environmental factors including levels of rainfall, wind speeds and wind direction.
2.	A stakeholder communications plan that includes community engagement before work commences onsite will be developed and implemented
3.	The name and contact details of person(s) accountable for air quality and dust issues will be displayed at the site boundary
4.	All dust and air quality complaints will be recorded, cause(s) identified, appropriate measures to reduce emissions taken in a timely manner, and the measures taken recorded
5.	Any exceptional incidents that cause dust and/ or air emissions, either on- or offsite, and the action taken to resolve the situation will be recorded;
6.	Daily onsite and offsite inspections will be undertaken to monitor dust, inspection results will be reported and be made available to the planning authority when requested
7.	To supplement visual inspections, dust deposition monitoring will be conducted at a number of locations in the vicinity of the development site (see Figure 9.1 for locations), including adjacent to the pNHA/cSAC using the Bergerhoff method (German Standard VD 2119, 1972). Results will be compared to the TA Luft guidelines. Should an exceedance of the TA Luft limit occur during the construction phase, additional mitigation measures, for example the erection of a screen along the site boundary, will be implemented
8.	The concrete batching plant will be located at the lowest level on site
9.	Earthwork activities and site haul roads will be sprayed regularly with water using sprinklers and bowsers to damp down, particularly during periods of dry weather. Measures will be provided to minimise run-off into the pNHA/cSAC;
10.	Earthworks and exposed areas/ soil stockpiles will be revegetated to stabilise surfaces if at all practical and as soon as practicable
11.	Vehicles and plant with low exhaust emissions will be used and will be serviced regularly. Engines will not be left running unnecessarily. In addition, vehicles will be monitored entering the site for noticeable exhaust emissions and site security personnel will have the power to ban offending vehicles from the site. These measures will minimise PM10 emissions;
12.	The Contractor works zones will be regularly cleaned and maintained as appropriate.
13.	Hard surface roads, under the Contractor's control, will be swept to remove mud and aggregate materials from the surface while any un-surfaced roads will be restricted to essential site traffic only.
14.	Internal haul roads will be paved at the earliest possible opportunity and inspected regularly for cleanliness
15.	Maximum-speed-limits on surfaced and unsurfaced haul roads and work areas will be sign-posted and

	mandatory
16.	Any road within site and off-site areas that has the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions.
17.	Vehicles using temporary haul roads will be restricted to 10 km per hour on any un-surfaced site road and on hard surfaced roads to suit the particular site conditions.
18.	Vehicles delivering or removing materials to site and off-site areas which present a risk of spillage of materials likely to give rise to dust or with dust potential will be enclosed or covered with tarpaulin at all times to restrict the escape of dust and or prevent spillages. Skips are to be covered.
19.	Public roads outside the site and off-site areas will be regularly inspected for cleanliness, and cleaned as necessary.
20.	Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to winds and in addition storage of unexposed soils will be seeded to prevent friability.
21.	Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
22.	The site will be set up to minimise movement of plant and material, thereby reducing site road degradation and dirt.
23.	Best practicable means will be employed to minimise air blown dust being emitted from the site. This will include covering skips and slack-heaps, wetting with water, seeding ground, covering ground (with tarpaulin or stone), netting of scaffolding, specifying equipment with upwardly pointing exhausts, and any other precautions necessary to prevent dust nuisances. Chemicals will not be used for any dust control operations.
24.	All vehicles, plant and equipment used in relation to the site are to be mechanically sound, operated and maintained in accordance with the manufacturer written recommendations, and switched off when not in use. Machinery exhausts will be positioned at a height to ensure adequate dispersion of emissions.
25.	Site access and egress points will be set up with dust minimisation in mind. Suitable facilities will be provided on site for vehicle cleansing to prevent carriage of dirt onto clean areas and/or off-site.
26.	Wheel Spray Booth or similar system shall be used for all trucks entering and leaving the site during the removal of soil and stone to achieve formation level.
27.	Wheel wash facilities will be provided with rumble grids to remove excess mud from wheels. These facilities will be located at all exits from the site and away from sensitive receptors and the pNHA/cSAC
28.	Areas where materials will be handled and stockpiled will be positioned away from main site access roads. These areas will also be designed to minimise their exposure to wind – all stockpiles shall be kept to the minimum practicable height with gentle slopes.
29.	If necessary, scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind.
30.	Surrounding roads used by trucks to access to and egress from the site will be inspected regularly and cleaned, using an approved mechanical road sweeper, when required. Roads to be cleaned subject to local authority requirements. Site roads will be cleaned on a daily basis, or more regularly, as required.
31.	Road edges and footpaths will be cleaned using a hand broom with controlled damping.
32.	In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed of in the normal manner.

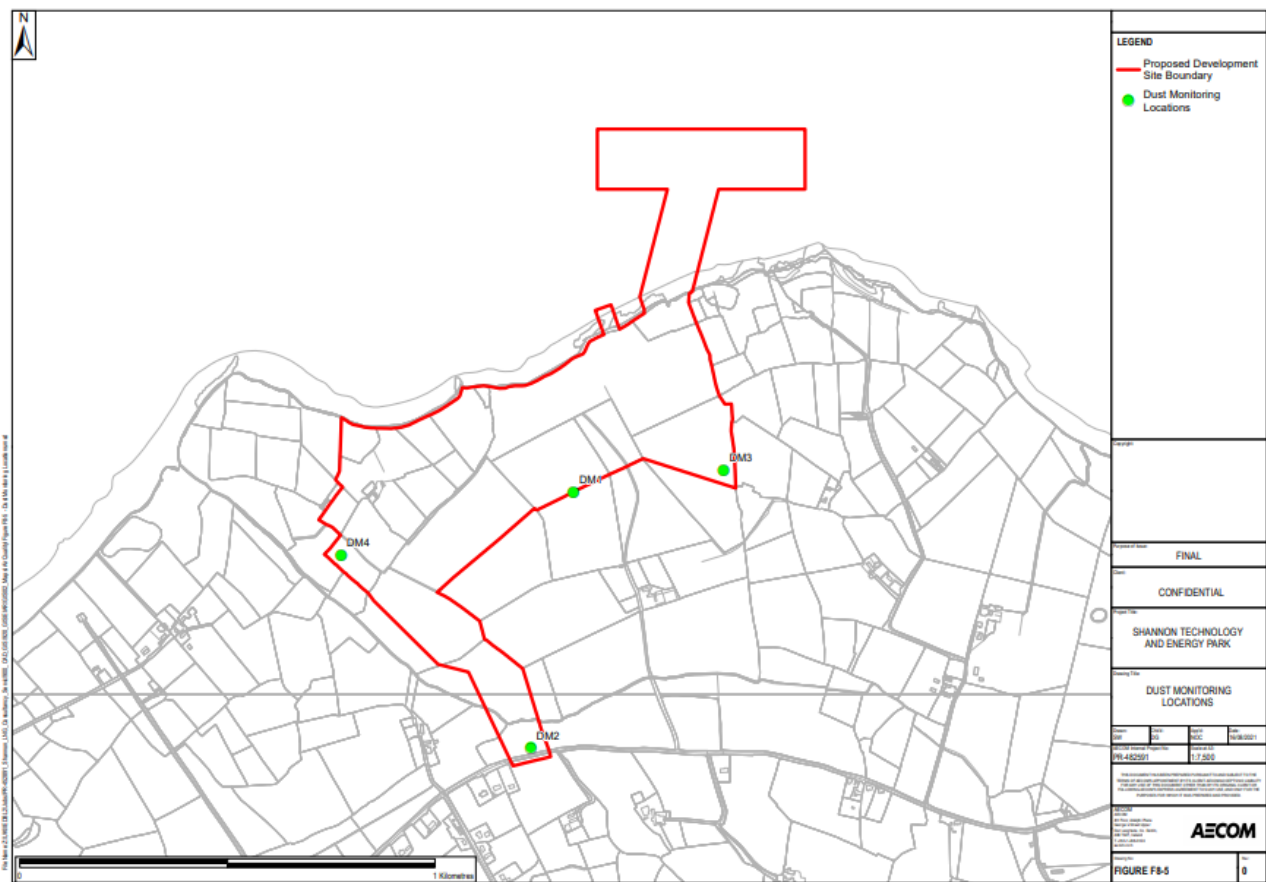


Figure 9.1 Dust Monitoring locations

9.2.10 Noise and Vibration Control Plan

The construction of the Proposed Development is expected to extend up to 32 months , and will result in emissions of noise from activities including earthmoving, blasting, excavations, and construction of facilities, with associated construction traffic on routes to the site.

During the construction phase there will be noise associated with site clearance, site access and internal road construction, site preparation, excavations, drilling/piling, and construction of berth facilities, and process facilities. There will be some excavation of rock at the site, and blasting may be required. The main noise sources will be excavation equipment, construction vehicles and construction plant operating on site, and associated noise from construction vehicles on roads serving the site.

Approximately three to four long term noise monitoring stations and one to two long term vibration monitors will be set up on the construction site boundary. The exact location of these stations will be determined in due course and will be chosen to best represent noise and/ or vibration emissions in the direction of nearby receptor positions. Monitoring will continue throughout the entire construction phase.

Long term noise monitoring stations will be equipped with an SMS and/ or email alert system so that site staff can be informed of potential exceedances. The results of the monitoring will be recorded and reported to relevant stakeholders in an appropriate manner and frequency, to be agreed in due course.

It is acknowledged the limits presented relate to construction works for road schemes, however it is assumed that noise sensitive receptors are likely to be equally sensitive to construction noise from other project types.

Period	$L_{Aeq,1hr}$ dB	$L_{p(max)}$ slow dB
Monday to Friday – 07:00 to 19:00	70	80

Period	L_{Aeq,1hr} dB	L_{p(max) slow} dB
Monday to Friday – 19:00 to 22:00	60 ¹	65 ¹
Saturday – 08:00 to 16:30	65	75
Sundays and Bank Holidays – 08:00 to 16:30	60 ¹	65 ¹

¹ Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority

Source: Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRA 2004)

Table 9.1 Maximum permissible noise levels at the façade of dwellings during construction

A log will be maintained on site of all noise / vibration complaints including those actions taken where trigger limits are exceeded;

- Name and address of complainant
- Time and date complaint was made
- Date, time and duration of noise
- Characteristics, such as rumble, clatters, intermittent, etc.
- Likely cause or source of noise
- Weather conditions, such as wind speed and direction
- Investigative and follow -up actions

The vibration thresholds in the following guidelines shall be followed and adhered to with regard to any potential vibration impacts during construction:

- BS6472: 2008. Guide to Evaluation of Human Exposure to Vibration in Buildings. Part 1: Vibration Sources other than Blasting; and
- BS7385: Part 2 1993: Evaluation and Measurement for Vibration in Buildings-Guide to Damage Levels from Ground-borne Vibration.

In general, the Contractor shall limit the hours during which site activities which are likely to create high levels of noise or vibration. This will be of particular relevance if out-of-hours / night-time work is required.

During construction works, the Contractor shall utilise the following noise abatement measures and comply with the recommendations of BS 5228:2009+A1:2014 - Noise Control on Construction and Open Sites. These measures will ensure that:

No.	Control Measures
1.	Normal working hours within the site will be restricted from Monday to Friday between 07:30Hrs and 18:00Hrs and Saturday between 08:00Hrs and 14:00Hrs unless otherwise stated. Site noise will be minimised at all times, especially at night and at weekends.
2.	When considering noise control at source the following elements will be taken into account: The noise level, and the likely duration of such noise. Noisy activities will be restricted to the appropriate part of site where possible in order to minimise local disturbance. Operations will be organised with regard to the positioning of equipment and the location of haul routes so as to minimise noise impacts. Machines in intermittent use will be shut down in the periods between works or throttled down to a minimum. Where noisy activity will take place near a noise sensitive location the use of noise screens and abatement equipment will be used as a method of minimising disturbance.
3.	Blasting vibration limits will be achieved by limiting the Maximum Instantaneous Charge (MIC) based on the results of trial blasts carried out in accordance with the procedure detailed in BS6472. It is noted there may be blasting charge limits imposed as a result of the underwater acoustic assessment. If these limits differ, the more stringent limit of the two will be adopted
4.	Controls will be in place to limit noise as detailed as follows (items 5 to 16):
5.	Soft-start for any source, including equipment testing, exceeding 170dB re: 1uPa @ 1m an appropriate ramp-up

	procedure (i.e., “soft-start”) must be used. This should be a minimum of 20 minutes and no longer than 40 minutes, for protection of bottlenose dolphins. See 9.2.2.2 Marine Flora and Fauna for further mitigation measures.
6.	All plant and equipment used on site will be the quietest of its type for carrying out the work required and will be maintained in good condition with regard to minimising noise output (this may include the fitting of sound reduction systems). All plant and equipment will be mechanically sound, and operated and maintained in accordance with the manufacturer written recommendations.
7.	Machines, which are used intermittently, will be shut down or throttled back to a minimum during those periods when they are not in use.
8.	Any plant, such as generators or pumps, which are required to work outside of normal working hours, will be surrounded by an acoustic enclosure.
9.	Heavy construction activities will be carried out during daytime hours only and restricted to the conditions of the full planning permission. This may also be subject to agreements made with the Client and local residents.
10.	Any tests or procedures which are known to be potentially noisy will be carried out during daytime hours only.
11.	Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
12.	Construction plant and equipment will comply with, EC (Construction Plant and Equipment) (Permissible Noise Level) Regulations.
13.	Noise monitoring is to be conducted during critical periods and at sensitive locations to be agreed in consultation with the KCC.
14.	Circumstances where the restriction on hours of work cannot be adhered to e.g. concrete pours, power floating works, etc. In these circumstances the Contractor will provide written agreement with KCC before any works start outside normal hours
15.	Throughout the contract, the supervision of the works will include ensuring compliance with the limits using the methods set out in BS:5228
16.	Good community relations shall be established and maintained throughout the construction process. This shall include informing residents on progress and ensuring measures are put in place to minimise noise and vibration impacts.

9.2.10.1 Blasting Mitigation – Air overpressure

It is expected that blasting will be required to excavate some of the rock, which cannot be removed by rock breaking equipment mounted on tracked excavators It is understood that no more than 3 blasts per day are envisaged. This will only take place during the enabling phase.

With regards the prediction of air overpressure, BS6472 states:

Accurate prediction of air overpressure is almost impossible due to the variable effects of the prevailing weather conditions and the large distances often involved.

Control of air overpressure should always be by its minimization at source through appropriate blast design.

In light of this, to minimise the impact of air overpressure and blasting it is recommended that:

No.	Control Measures
1.	Blasting is carried out in accordance with the principles set out in BS 5607:2017 Code of practice for the safe use of explosives in the construction industry
2.	Ensuring appropriate burden to avoid over or under confinement of the charge
3.	Accurate setting out and drilling
4.	Appropriate charging
5.	Appropriate stemming with appropriate material such as sized gravel or stone chippings
6.	Using delay detonation to ensure smaller maximum instantaneous charges (mics)
7.	Using decked charges and in-hole delays

8.	Blast monitoring to enable adjustment of subsequent charges
9.	Designing each blast to maximize its efficiency and reduce the transmission of vibration
10.	Avoiding the use of exposed detonating cord on the surface in order to minimize air overpressure – if detonating cord is to be used in those cases where down-the-hole initiation techniques are not possible, it should be covered with a reasonable thickness of selected overburden; and
11.	A protocol for community relations with regards blasting is adopted such that prior warning of blasting operations is given to members of the public.

9.2.11 Resource Usage Control Plan

Construction material would be sourced locally as much as possible to minimise the environmental impact of transportation. It is intended that all suitable stone recovered on the site will be reused as hardcore in the building construction and for the rock fill in the embankment. For this purpose, rock crushing and screening plant will be provided. Additional rock, stone and sand materials will be procured from local quarries as required.

Some of the process equipment and structural elements will arrive on site as complete units or sub-assemblies which will be larger than normal construction loads. It is anticipated that most of the units will be delivered by ship to Foynes or another port, and from there transported to the site by road. Some of the units may be 'extra-large loads' and a Garda escort may be required when they are on the road network. The timing of their transport to the site will be chosen to minimise disruption to other roads users.

During the construction phase of the project water will be required for consumption by the construction personnel, for general construction works.

It is predicted that 50 cubic metres of water will be required for the construction workforce at peak. This potable water will be delivered by road and stored in a temporary tank on-site.

The construction of the LNG Terminal will require approximately 110 m³/day at its peak.

Resource controls will include the following:

No.	Control Measures
1.	Measures to control essential resources such as energy, water, transport and general building materials will be managed throughout the project and stipulated in the Site-Specific CEMP.
2.	Site safety and waste management will benefit from more efficient management of site materials.
3.	Signage will be visible in appropriate site areas to serve as a reminder of resource usage to all site staff.
TRAVEL	
4.	Personnel transport associated with the project will be assessed in order to reduce associated carbon expenditure. The Contractor will engage site personnel to encourage the use of green transport options including car-pooling, public transport, walking and cycling.
5.	Material transport associated with the project will be assessed in order to reduce associated carbon expenditure. The Contractor will engage the supply chain to reduce the number of vehicle movements relating to site material.
ENERGY	
6.	Electric power supply for the construction phase will require either a mains substation to be installed or a series of portable site units will be employed.
7.	All offices and drying rooms energy efficiency measures will include: installation of sprung door closers in external doors, awareness notices to save energy, timers on heaters and boilers, sensors/PIR's for lighting where possible and supervision to switch off other lights, computers, etc at the end of the day.
8.	Electrical Meter will be installed to monitor all electrical consumption for the duration of the project.
9.	All diesel used for the duration of the works will be logged.

10. Documents will be emailed instead of photocopying where possible.

MATERIALS

11. Printers will be set to print on both sides of paper.

12. Reuse of site won material will be promoted. Excavated soil will be reused on site wherever possible to reduce the need for imported fill.

13. Sustainable materials will be given consideration and used where possible, e.g. reusing site won materials, using locally sourced materials, using Ground Granulated Blast Furnace Slag (GGBS) concrete, purchasing recycled materials, sustainably sourced certified timber.

14. Material purchasing will include full specification of materials for just-in-time delivery. Unused materials will be returned to supplier on agreement.

15. Work will be planned to prevent waste of materials.

16. Material storage and movement will be well organised to prevent damage and waste.

17. Unnecessary materials will be promptly removed from site for reuse where possible.

WATER

18. All water supply will be maintained and fitted with stop taps.

19. Water meters will be installed to monitor all water consumption for the duration of the project.

20. Water will be reused where possible.

9.2.12 Sensitive neighbours plan

No. Control Measures

1. The Contractor will respect all site neighbours by proactively addressing any concerns.

2. All work will be carried out with positive consideration to the needs of neighbours and the general public. At all times during construction we will protect the privacy of neighbours and ensure that all site personnel, plant and equipment; including that of all subcontractors, suppliers and visitors will not trespass or cause nuisance to the local environment.

3. Examination period will be taken in consideration in the programming of the works.

4. Any complaints received will be managed in a responsible manner.
The Contractor will appoint a Community Liaison Officer to co-operate with the Public Relation Officer who will liaise with members of the public.

5. The specific Construction Traffic Management Plan will be implemented to minimise the effect of the construction traffic on the surrounding network, local community and the environment. The CTMP will be submitted under separate cover in addition to this CEMP.
