

Shannon Technology and Energy Park (STEP) Power Plant

Appendix A2.3: Construction Environmental Management Plan

Shannon LNG Limited



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Environmental Impact Assessment Report - Volume 4 Appendices
Appendix A2.3 Construction Environmental Management Plan (CEMP)

Shannon LNG Limited

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Table of Contents

1.	Introduction	6
1.1	Background.....	6
1.2	Purpose and Scope	6
1.3	Content of this CEMP	6
1.4	Supporting Environmental Documentation	7
1.4.1	Guidance Documents	7
2.	Overview of the Proposed Development	9
2.1	Introduction	9
2.2	Overview of the Proposed Development	9
2.3	Site Access	11
2.4	Enabling, Site Preparation and Earthworks.....	11
2.4.1	Construction Compound	13
2.4.2	Fencing	14
2.5	Construction Works	14
2.5.1	Construction Programme.....	14
2.5.2	Working Hours	14
2.5.3	Construction of the Power Plant	15
2.5.4	Construction of the AGI	15
2.5.5	Construction of the Drainage Outfall	16
3.	Environmental Objectives and Targets	17
3.1	Environmental Objectives and Targets	17
3.2	Best Practice Guidance	17
4.	Environmental Responsibilities and Organisation	18
4.1	Environmental Roles and Responsibilities	18
4.2	Contractor’s Site Staff.....	18
4.3	Roles and Responsibilities	18
5.	Non-Conformance, Corrective and Prevention Action Plan.....	20
6.	Communications	21
6.1	Internal Communications	21
6.1.1	Internal Environmental Meetings	21
6.1.2	Internal Environmental Reports	21
6.1.3	Internal Environmental Records	22
6.1.4	Unscheduled Communication.....	22
6.2	External Communications.....	23
6.2.1	Communications Personnel.....	23
6.2.2	Specific Environmental Meetings	23
6.2.3	Complaints Management.....	23
7.	Training and Awareness	24
7.1	General Environmental Training and Awareness	24
7.2	Environmental Induction	24
7.3	Toolbox Talks	25
7.4	Environmental Labelling and Signs	26
7.5	Specific Environmental Training	26
8.	Resource Waste Management Plan (RWMP)	27
8.1	Introduction	27
8.2	Waste Management Policy	27
8.3	Objectives for the Proposed Development	28
8.4	Overview of Waste Streams	29
8.5	Prevention, Reuse and Recycling	29

8.5.1	Prevention and Preparing for Reuse	29
8.5.2	Recycling	30
8.5.3	Recovery.....	30
8.5.4	Disposal	30
8.6	Waste Handling	30
8.7	Mitigation Measures	31
8.8	Legal Compliance	32
8.8.1	Waste Management Companies	32
9.	Environmental Mitigation Measures.....	33
9.1	General Environmental Procedures	33
9.1.1	Outline of Potential Environmental Procedures.....	33
9.2	Mitigation Measures – Environmental Control Plans.....	34
9.2.1	General Mitigation Measures.....	34
9.2.2	Cultural Heritage - Archaeology and Architectural Control Plan.....	35
9.2.3	Biodiversity Control Plan	36
9.2.3.1	Marine Ecology	37
9.2.3.2	Terrestrial Ecology.....	38
9.2.3.3	Biodiversity and Landscape Plan.....	39
9.2.3.4	Invasive Species	44
9.2.4	Surface Water Management / Discharge Control Plan	45
9.2.4.1	Bedrock Excavation	45
9.2.4.2	Construction Dewatering.....	45
9.2.4.3	Surface Water / Storm Water	45
9.2.4.4	Pre-Earthworks Drainage.....	46
9.2.4.5	Fuel and Chemical Handling.....	47
9.2.4.6	Sources of Aggregates and Clean Fill for the Proposed Development	48
9.2.4.7	Foul Sewer	48
9.2.4.8	Flood Risk	48
9.2.5	Environmental Emergency Response Plan	49
9.2.5.1	Control of Concrete and Lime	50
9.2.6	Ground (Soil) Control Plan	50
9.2.6.1	Soil Removal and Compaction.....	51
9.2.7	Resource and Waste Management Plan (RWMP)	52
9.2.8	Landscape and Visual (incl. Maintenance & Housekeeping) Control Plan	54
9.2.8.1	Visual (Maintenance & Housekeeping) Control Plan	54
9.2.9	Air Quality and Dust Minimisation Management Plan	55
9.2.10	Noise and Vibration Control Plan	58
9.2.10.1	Blasting Mitigation.....	61
9.2.11	Resource Usage Control Plan	63
9.2.12	Sensitive Neighbours Plan	65

Figures

Figure 2.1:	Layout of the Site for the Proposed Development.....	10
Figure 2.2:	Overview of the Proposed Development	10
Figure 8.1:	Waste Hierarchy	28
Figure 9.1:	Dust Monitoring Locations	57

Tables

Table 2.1: Construction Programme	14
Table 6.1: Internal Environmental Reports	22
Table 6.2: Internal Environmental Records	22
Table 9.1: General Mitigation Measures	34
Table 9.2: Cultural Heritage Mitigation Measures	35
Table 9.3: Biodiversity - General Mitigation Measures	37
Table 9.4: Marine Ecology – Underwater Noise Mitigation Measures	38
Table 9.5: Terrestrial Mitigation Measures	40
Table 9.6: Pre-Earthworks Drainage and Surface Water Drainage Mitigation	46
Table 9.7: Fuel and Chemical Handling Mitigation	47
Table 9.8: Flood Risk Mitigation	48
Table 9.9: Environmental Emergency Response Mitigation	49
Table 9.10: Concrete and Lime Mitigation Measures	50
Table 9.11: Land, Soil and Geology General Mitigation Measures	51
Table 9.12: Soil Removal and Compaction Mitigation Measures	52
Table 9.13: Resource and Waste Management Mitigation Measures	53
Table 9.14: Maintenance & Housekeeping Mitigation Measures	54
Table 9.15: Air and Dust Mitigation Measures	55
Table 9.16: Noise and Vibration Mitigation Measures	60
Table 9.17: Blasting Mitigation Measure	62
Table 9.18: Resource Mitigation Measures	63
Table 9.19: Sensitive Neighbours Mitigation Measures	65

1. Introduction

1.1 Background

AECOM Ireland Limited (hereafter referred to as 'AECOM') has been appointed on behalf of Shannon LNG Limited (herein referred to as "the Applicant"), an Irish owned subsidiary of New Fortress Energy (NFE) Inc. to prepare a Construction Environmental Management Plan (CEMP) in relation to a planning application to An Bord Pleanála (ABP) ("the Board") for a Combined Cycle Gas Turbine (CCGT) gas-powered power plant capable of 600 MW of electricity generation, 120 MWh (1-hr) Battery Energy Storage System (BESS), Above Ground Installation (AGI), and associated plant, equipment and infrastructure which will be known as the Shannon Technology and Energy Park Power Plant (STEP Power Plant) (herein referred to as the "Proposed Development"). The Site of the Proposed Development (herein referred to as "the Site") is located between Tarbert and Ballylongford, Co. Kerry.

1.2 Purpose and Scope

The purpose of this CEMP is to set out the high-level approach to the management of environmental mitigation measures required during the construction phase to minimise or mitigate any impact of construction works on the environment.

It has been developed on behalf of the Applicant to accompany the planning application to the Board. This will act as the overarching document ensuring environmental compliance for the development.

This CEMP summarises the environmental commitments of the construction phase, and the measures to ensure compliance with legislation and the requirements of statutory bodies, all as detailed in the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS) submitted with the planning application.

This CEMP will be used by the appointed contractor ("the Contractor") as the basis for the development of a Contractor's / final CEMP, which will be prepared prior to construction and will include any additional mitigation requirements as and when they arise. The 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. The Contractor's CEMP will take account of this CEMP and any planning conditions upon grant of permission for the Proposed Development. This CEMP does not address the operational phase of the proposed facility.

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

This CEMP will be a live document and will be reviewed and updated, as necessary.

1.3 Content of this CEMP

This 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 and 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:** Overview of the Proposed Development.
- **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:** Resource and Waste Management Plan.
- **Section 9:** Environmental Mitigation Measures.

1.4 Supporting Environmental Documentation

This CEMP summarises the environmental commitments of the construction phase, and the measures to ensure compliance with legislation and the requirements of statutory bodies, all as detailed in the EIAR Volumes 1 to 4 and the NIS submitted with the planning application.

1.4.1 Guidance Documents

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

- Kukadia, Vina; Upton, Stuart; Hall, David (2003). *Control of Dust from Construction and Demolition Activities*.
- British Standards Institution (BSI) (2014). *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise*.
- British Standards Institution (BSI) (2014). *BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration (together referred to as B.S. 5228)*.
- Construction Industry Research and Information Association (CIRIA) (2023). *Environmental good practice on site guide (5th edition) (C811)*.
- Construction Industry Research and Information Association (CIRIA) (2006). *Control of water pollution from linear construction projects. Site guide (C649)*.
- Construction Industry Research and Information Association (CIRIA) (2006). *Control of Water Pollution from Linear Construction Projects. Technical Guidance (C648)*.
- Construction Industry Research and Information Association (CIRIA) (2001). *Control of water pollution from construction sites. Guidance for Consultants and Contractors (C532)*. Site Procedure 6 (Above-Ground Oil Storage Tanks) from CIRIA C532 Control of Water Pollution from Construction Sites.

- Environment Agency (2013). *The Knotweed Code of Practice. Managing Japanese knotweed on Development Sites (Version 3)*.
- Environment Agency (2011). *Pollution Prevention Guidelines No. 2 (Above Ground Oil Storage Tanks) from the UK Environment Agency*.
- Environmental Protection Agency (EPA) (2021). *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*.
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.
- Inland Fisheries Ireland (IFI) (2016). *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters*.
- Institute of Air Quality Management (IAQM) (2014). *Guidance on the Assessment of Dust from Demolition and Construction*.
- National Roads Authority (NRA) (2007). *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan*.
- National Roads Authority (NRA) (2008a). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes*.
- National Roads Authority (NRA) (2008b). *Guidelines for the Treatment of Otters during the Construction of National Road Schemes*.
- National Roads Authority (NRA) (2010). *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*.

2. Overview of the Proposed Development

2.1 Introduction

The Proposed Development will be located on the Shannon Estuary, approximately 4.5 km from Tarbert and 3.5 km from Ballylongford, Co. Kerry. The application Site boundary ('red line') encloses an area of approximately 41 hectares (ha) and is entirely owned by the Applicant.

There are a small number of residential properties located within 500 m of the Site. Residential properties are also located along the existing L1010 road (Coast Road) immediately south of the Site, with additional residential properties, again to the south of the Site, to the east and west along the L1010 road.

Tarbert Power Station is located approximately 5 km to the north-east of the Site. Moneypoint Power Station located on the northern shore of the Shannon Estuary, approximately 3 km to the north of the Site.

2.2 Overview of the Proposed Development

The Proposed Development will consist of the following main components:

- Three (3 No.) 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.
- A 120 MWh (1-hr) Battery Energy Storage System (BESS).
- High voltage 220 kV Gas Insulated (GIS) Substation.
- Auxiliary Boiler.
- Raw water treatment and storage.
- Firewater storage tanks and fire water pumps.
- Ancillary buildings.
- Secondary Fuel and Storage.
- Above Ground Installation (AGI) compound.
- Sewerage drainage system.
- Process effluent collection system and sump.
- Structural / Architectural Buildings (various).

The Proposed Development will provide additional and flexible power generation capacity to support intermittent renewable generation and resolve a predicted generation capacity shortfall, in line with national policy goals. For example, during periods of high wind (renewable) generation it is expected that the Proposed Development will be turned off by the system operator (EirGrid) to give priority to renewable power.



Figure 2.1: Layout of the Site for the Proposed Development

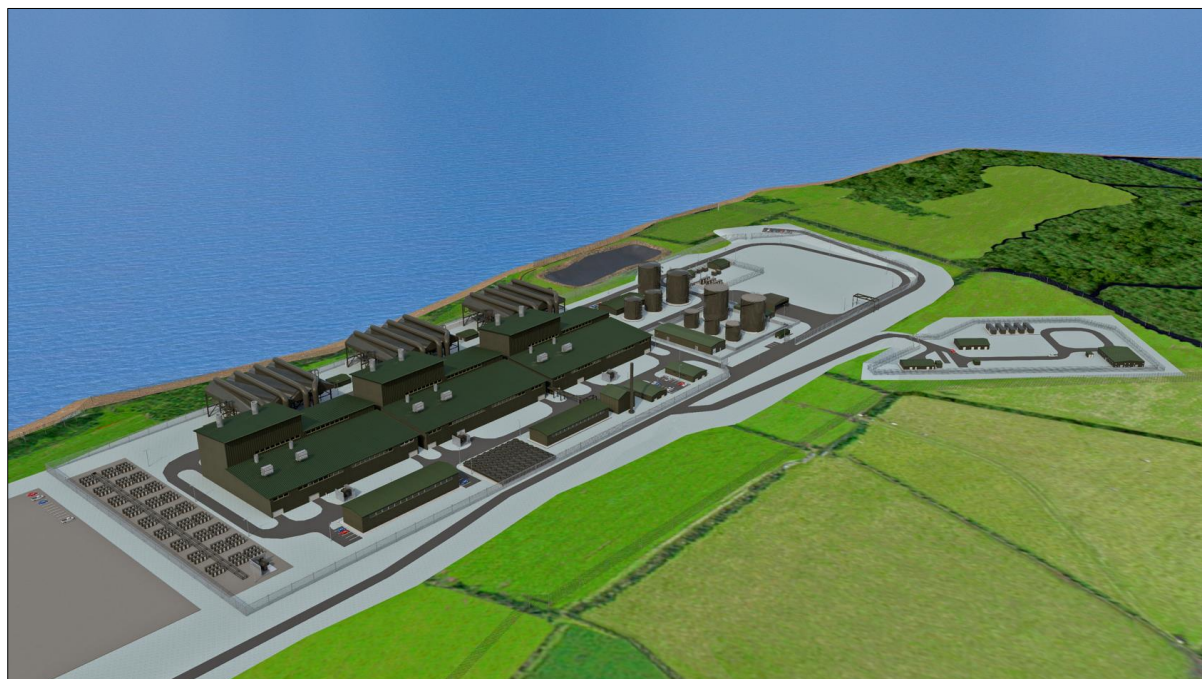


Figure 2.2: Overview of the Proposed Development

2.3 Site Access

The Contractor will begin by setting out the Site entrance as early as possible in the programme consistent with seasonal environmental restrictions and constraints. Construction traffic will access and egress the Site via a new priority junction and right turn pocket along the upgraded L1010 road. This new vehicular entrance will serve all traffic arriving to the Site.

Access to the Site will be controlled and all Site visitors will be required to sign in on arrival and sign out on departure. There will be security fencing around the construction compound and specific areas of the Site for access control, safety and security.

All Heavy Goods Vehicle (HGV) construction traffic will only be allowed to travel from the N69 / N67, through Tarbert town and along the upgraded L1010 road to the Site. No HGV traffic will be permitted to travel / from the Ballylongford Village direction to the Site or along the R551.

The Contractor will begin by setting out the Site entrance 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 road and progress along the route of the access road to the construction laydown area. This will be followed closely by the excavation of 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.

It is anticipated that the creation of this initial access will take approximately two to three months. Apart from the delivery of materials, the operation will all take place within the Site boundary with personnel using mobile plant. Following the construction of the Site access, a perimeter fence will be erected around the Site boundary, refer to **Section 2.3.1**.

Traffic management measures approved by Kerry County Council (Co. Co.), Limerick Co. Co. and An Garda Síochána will be implemented prior to the commencement of works to ensure the Site access is safe for all road users.

2.4 Enabling, Site Preparation and Earthworks

Pre-construction environmental surveys will be undertaken in advance of the enabling works. Following the surveys, licences will be sought from the National Parks and Wildlife Service (NPWS), as appropriate. Exclusion works will be carried out in the appropriate season.

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

This will include the demolition of a small farm complex and remains associated with a pillbox, refer to Drawing 60619377-DEM-C-SLNG-0001, submitted with this application, for the location of all structures to be demolished. It is anticipated that archaeological survey and investigation works will commence in advance of the main enabling works in accordance with the relevant licenses. Enabling works will only be carried out on areas where archaeological survey and investigation works have been completed.

Prior to the start of works onsite areas to be protected (such as ecologically sensitive habitats or notable trees) will be fenced off to protect from accidental damage.

Some hedgerows, bushes and trees, and disused buildings, will also be removed during this phase. It is noted that the seasonality of some of the activities is likely to be limited, for example, by seasonal environmental ecological restrictions and constraints (e.g. bird nesting season), and / or by restrictions on when soils can be placed. Where this is the case, the overall programme will be adapted to limit or prevent the risk of impacts in accordance with the Contractor's CEMP.

Site preparation will commence with the establishment of safe access and temporary site roads. A perimeter fence will be erected around the Site boundary, refer to **Section 2.3.2**.

A 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.

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 earthwork's phase. Areas within the Site, which are not to be disturbed during the construction phase, 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 facilities. The Proposed Development will be constructed to a finish grade platform with an elevation of 18 m OD. In order to create this platform, approximately 475,000 m³ of overburden soils and rock will be excavated and moved within the Site. Some of the rock will need to be broken up before it can be excavated. This will be done either by percussive rock breaking equipment mounted on tracked excavators or by blasting depending on the hardness and depth of the rock to be removed. The blasting will be carried out in a controlled manner in accordance with a pre-approved plan, and 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 into 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. No more than one blast is envisaged to occur in any given day and associated noise and vibration levels will be transient and very short lived.

Monitoring of dust, noise and vibration levels will be undertaken during blasting operations at appropriate locations around the Site boundary.

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. Excess excavated material will be stockpiled for use as engineering fill, landscaping and other uses throughout the Site.

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, refer to **Figure 2.1**. Stockpiles will be no more than 2-3 m high and will be seeded with an appropriate seed mix. All topsoil will be retained onsite for future use.

All the materials will be transported to the Site by road. It is anticipated that up to 26,000 tonnes of imported aggregates will be required for the Proposed Development. Sources of material could include:

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

2.4.1 Construction Compound

The proposed location of the construction compound will be entirely within the Site of the Proposed Development, refer to **Figure 2.1**.

The construction compound will be secured with temporary fencing and will accommodate employee parking, canteens, offices, medical, changing, and welfare facilities, drying rooms and temporary services on the Site.

The construction compound will be constructed by stripping back the topsoil (to be used later in the landscaping) and placing a layer of stone over a layer of geotextile membrane as required. The construction compound will be suitably drained and any areas which will involve the storage of fuel and refuelling will be paved with bunding and hydrocarbon interceptors to ensure that no spillages percolate into the surface water or groundwater systems. During the removal of the topsoil and placement of the stone for the laydown areas precautions will be taken to minimise runoff into ditches, drains or the stream.

The construction compound will not be for long-term storage of materials, and storage but will be for the duration of the construction phase only. Foul water from welfare facilities during the construction phase will be collected and periodically removed from the Site by road tanker.

For the duration of the construction phase, mobile plant will be returned to a secure overnight plant storage area on the Site, at the end of each shift. Drip trays will be utilised under the various types of plant.

Storage areas will be provided for flammable / toxic / corrosive materials, in a separate location that will be locked, impermeable bunded and fenced off. Material data sheets will be used for all these materials.

Parking will be available onsite for all construction staff vehicles within the construction compound.

Following completion of construction, the construction compound will be cleared and re-instated, temporary buildings and containers, parking areas and material such as stone, aggregates and unused

construction materials will be removed as appropriate. As much of this material as possible will be re used onsite as part of landscaping and construction works.

2.4.2 Fencing

Fencing will be erected along the perimeter of the Site as early as possible. Particular care will be taken at the boundary between the Site and the SAC, SPA and pNHA so that construction activities do not cause damage to habitats in this area. These habitats will be securely fenced off early in the construction phase. The fencing will be clearly visible to machine operators and include relevant areas in which works are planned, such as utilities. Fencing will be installed to protect the Ralappane stream.

To prevent incidental damage by machinery or by the deposition of spoil during site works, hedgerow, tree and scrub vegetation which are located in close proximity to working areas will be clearly marked and fenced off to avoid accidental damage during excavations and site preparation.

2.5 Construction Works

2.5.1 Construction Programme

Subject to planning consent and other approvals an anticipated start date of January 2026 is taken as a construction start date (however this is subject to change).

The construction programme is anticipated to take 32 months, subject to seasonal and other planning constraints. The whole construction phase is broken into four sections, as outlined in **Table 2.1**.

Table 2.1: Construction Programme

Description	Start On Site	Duration (months)	Completion	Duration From Start Date (Months)
Enabling, Earthworks & Site Preparation including	Jan 26	10	Oct 26	10
220 kV and medium voltage (10 / 20 kV) connections¹	Aug 26 (+ 8 months)	14	Sept 27	21
CCGT - 2 Blocks	Oct 26 (+ 10 months)	21	June 28	30
CCGT - 1 Block	Mar 27 (+ 15 months)	18	Aug 28	32

An additional period of up to six months will be required for commissioning prior to operation.

2.5.2 Working Hours

Construction phase works will take place between the hours of 07:30 to 18:00 (Monday to Friday) and 08:00 to 14:00 (Saturday). No works will take place on Sundays or Bank Holidays.

It is proposed to stagger the various shift starting and ending times within the construction complex (for example civil employees 07:30 – 18:00, or 07:45 – 17:45). This small stagger in shift start and ending times could lessen the impact of traffic peaking.

¹ While the 220 kV and medium voltage (10 / 20 kV) connections are outside the Proposed Development, number and traffic from their construction is included in this EIAR. This includes the associated onsite Eirgrid 220 kV and ESBN 20 kV substations.

Construction works outside these hours will only take place in exceptional circumstances (*i.e.*, for specific engineering works e.g., concrete pours etc.). It is likely that a number of continuous construction phase works will also be required outside these hours on a limited number of occasions. These works will be agreed in advance with Kerry Co. Co. 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 Kerry Co. Co. Details of what are to be undertaken (including what type of noisy equipment and for how long) will be submitted with the application to Kerry Co. Co. Work conducted outside of core hours, will comply with any restrictions agreed with the planning authorities, in particular regarding the control of noise and traffic.

2.5.3 Construction of the Power Plant

Construction of the Proposed Development (the Power Plant) will begin after the platform level has been excavated to 18 m OD and the surface prepared.

The construction works for the Proposed Development will be divided into four sections:

- Civil and structural works.
- Mechanical and electrical installation.
- Gas infrastructure.
- Connection to the EirGrid 220 kV Substation.

Foundation construction will include excavating to a depth of approximately 2 m to 3 m, installation of concrete forms, fixing of steel reinforcing, and the pouring of concrete. Pile foundations are likely to be necessary for parts of the Proposed Development, depending upon soil conditions and design loading. The majority of the plant and building materials for the Proposed Development will be procured as complete units or modular, where practicable, and delivered to the site for installation. Pipe work and ducting will be assembled onsite.

2.5.4 Construction of the AGI

The construction of the AGI will be undertaken following enabling works over a period approximately 12 months and will encompass the following activities:

- Placement of concrete foundations, drainage system, power and instrumentation conduits.
- Installation and erection of process and utility equipment, piping and instrumentation.
- Construction of buildings.
- Site landscaping.

Structural steel for buildings is anticipated to be delivered by road and assembled onsite.

The majority of the building materials for the AGI will be purchased as complete units, where practicable, and delivered to the Site for installation. Pipe work and ducting will be assembled onsite.

2.5.5 Construction of the Drainage Outfall

A drainage outfall into the Shannon Estuary will be constructed. Within the Site, surface water from paved and impermeable areas and groundwater will be collected by an underground drainage system and will discharge to either, the existing stream and / or drainage ditches within the Site, or to the Shannon Estuary via the drainage outfall pipe which will extend across the foreshore to below the low water mark.

The drainage outfall pipe will be buried as it crosses the shoreline and will extend approximately 5 m beyond the low water mark. A check valve will be installed at the end of the outfall drainage pipe to prevent ingress of water from the estuary back into the drainage system.

It is anticipated that the construction of the drainage outfall pipe will be an open cut trench technique as follows:

- Excavate a trench across the foreshore to a maximum depth of approximately 2.4 m.
- Install a 900 mm diameter concrete drainage pipe in trench and backfill with concrete.
- Reinststate the foreshore and shoreline.

The outfall trench will be excavated above the low water mark using a hydraulic rock breaker mounted on a tracked excavator. This operation will be carried out in the dry at all times working above the tide during a suitable period of spring tides.

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.

Below the low water mark, the trench will remain open, and the sides of the trench will be battered back to avoid creating a pocket for siltation. Additionally, the cliff face will be armoured with rock to prevent erosion and maintain the integrity of the foreshore. Disturbance of the seabed below the low water mark will be small, arising primarily from the excavation of the trench and clearing and levelling of the ground to install the outfall pipe.

All refuelling of equipment and machinery will take place at designated refuelling areas on the Site. No refuelling will take place on the foreshore. Arisings from trenching, or other works, will either be used for reinstatement.

3. Environmental Objectives and Targets

3.1 Environmental Objectives and Targets

The objective of this CEMP is to ensure that the development works take place with no likely significant effects on the environment or the surrounding areas and that all environmental conditions that will 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 Kerry Co. Co. in advance of the Proposed Development.

3.2 Best Practice Guidance

All works carried out on the Proposed Development 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.

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 Contractor.

The Contractor's / final CEMP shall set out the roles and responsibilities of the principal parties involved in the construction of the Proposed Development.

In addition, it will 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 Contractor's / final 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 (H&S) Officer, an Environmental Clerk of Works (EcOW) / Advisor, and a Public Liaison Officer.

4.3 Roles and Responsibilities

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.
- 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.

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 NIS (subject to any modifications by statutory consent).
- e) Ensuring any monitoring requirements are implemented as required.
- f) Reviewing monitoring results.
- g) Training of staff in all environmental issues.
- h) Provision of Toolbox 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 Co. Co. 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 Construction Traffic Management Plan (CTMP), Resource Waste Management Plan (RWMP), and the CEMP.
- r) Carry out waste audits to ensure waste is segregated and controlled, and duty of care is followed with contractors.

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 Kerry Co. Co. on reporting timelines, and close-outs.
- Determine preventive measures and ensure they are effective.
- Verify the effectiveness of the correction of the non-compliance.
- 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.

6. Communications

Effective communications are essential to the efficient delivery of the CEMP during the development of the Proposed Development. Therefore, communications procedures will 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 communication strategy, making recommendations to the contractors, for example such as the implementation of toolbox talks (environmental discussion on issues encountered onsite) by the Contractor relating to environmental constraints and procedures to be adhered to onsite.
- An outline reporting programme and procedure to be updated by the Contractor.
- 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 Proposed Development staff to ensure they are suitably informed of environmental aspects associated with the Proposed Development. The training and awareness structure for Proposed Development staff shall be compiled by the Contractor and agreed with the Applicant.

6.1.1 Internal Environmental Meetings

Environmental matters shall be discussed weekly during the Contractors team meetings. These meetings will 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 Progress Reports	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 Monitoring Reports	A summary report containing the details of any environmental monitoring for the period on aspects such as water quality, dust, noise and vibration.
Environmental Incident Reports	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 Audit Reports	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.

6.1.3 Internal Environmental Records

The Contractor will 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

Report Type	Description
Environmental Weekly Inspection Record	To be completed when carrying out routine environmental inspections.
Environmental Monitoring Reports	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 Induction / Toolbox Talk Register	To be completed by all staff attending an environmental induction.
Environmental Incident Record	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 Kerry Co. Co., NPWS, IFI or the 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 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 will be responsible for ensuring that appropriate environmental training is provided to all Site personnel and that environmental awareness is continuously promoted throughout the pre-construction enabling phase of the Proposed Development. Appropriate levels of environmental training and awareness will be provided on the project through the following approaches:

- Environmental Inductions.
- Toolbox Talks.
- Environmental Labelling and Signage.
- Specific Environmental Training or Briefings.
- Specific Environmental Awareness Procedure.

7.2 Environmental Induction

All personnel will receive an environmental induction before commencing work on the Site. 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 Site 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 Proposed Development and its key environmental aspects.
- Organisational structure for the construction phase of the Proposed Development 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 Proposed Development 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 Proposed Development culture is waste minimisation, reuse and recycling. Waste management policies for the Proposed Development 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 Toolbox Talks

Toolbox Talks will be given on a regular basis throughout construction works and may often be specific to a particular activity taking place. Regular toolbox 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 toolbox talk, the employee will sign a form to provide a record of their attendance. Examples of some of the environmental toolbox talks required during construction works will include the following:

- Archaeology / heritage.
- Biodiversity / Ecology (Flora & Fauna, including protected species).
- Resource usage.
- Dust.
- Spill Incident Control.
- Water discharges.
- Watercourse and fisheries protection.
- Invasive species.
- Visual impact.
- Noise levels.
- Waste management.
- 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 Proposed Development 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 toolbox 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 Proposed Development.
- **Sensitive neighbours:** Talks to sub-contractors on noise, dust and traffic management as required during different phases of the Proposed Development.
- **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. Resource Waste Management Plan (RWMP)

8.1 Introduction

A site-specific Resource Waste Management Plan (RWMP) has been submitted with the planning application (Appendix A16.1, Volume 4 of the EIAR).

The RWMP will be updated by the Contractor into a Contractor's RWMP prior to commencement of works and will be part of the Contractor's CEMP. The Contractor's RWMP will be required to comply with the EPA (2021) '*Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Waste Projects*'.

The implementation of the RWMP 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 RWMP 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 the Site.

8.2 Waste Management Policy

The European Communities (Waste Directive) Regulations S.I. No. 126 of 2011 (as amended) (GOI, 2011) transpose the requirements of the European Waste Framework Directive (Directive 2008/98/EC) (European Parliament and The Council of the European Union, 2008), as amended by Directive (EU) 2018/851 (EU, 2018), into Irish legislation (herein after referred to as 'The Regulations'). The Regulations require that waste prevention programmes and waste management plans are established and that the waste hierarchy is applied. The waste hierarchy prioritises waste prevention, followed by preparing for reuse, recycling, other recovery (including energy recovery) and finally disposal.

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in **Figure 8.1**. The Contractor will use the Waste Hierarchy as a guide to encourage the prevention of waste and to define waste management options.

When considering waste management options for the Proposed Development, the Contractor will take account of the site's location, natural environment, and available infrastructure. The Contractor will consider the following options when determining the preferred waste management option for each waste stream.

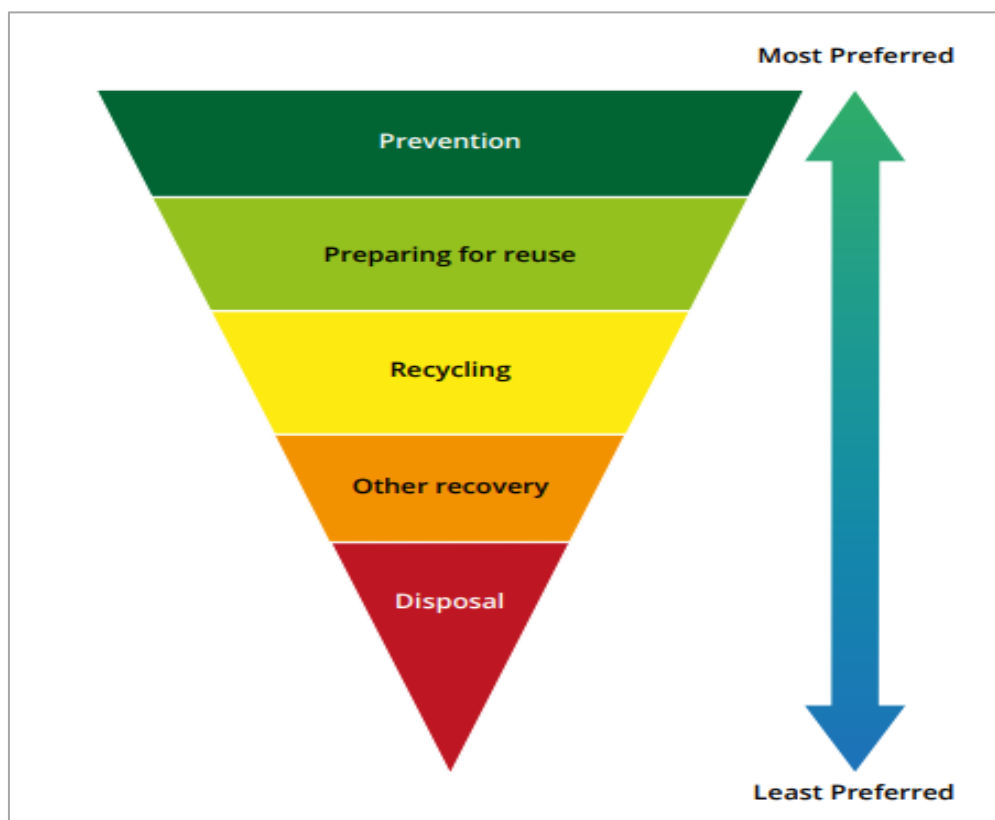


Figure 8.1: Waste Hierarchy

Source: EPA 2021b. *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*

The Contractor will take all reasonable steps to ensure that:

- All waste from the Site is dealt with in accordance with the legal requirements.
- Materials are handled efficiently, and waste managed appropriately.
- Adherence to the RWMP Guidelines.

8.3 Objectives for the Proposed Development

The SWMP shall meet the following requirements of the Proposed Development:

- 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.

RWMPs are used as a good practice measure on construction projects and to support planning and consenting applications.

The RWMP will be developed to act as a guide for site staff on how to manage construction materials and waste, in accordance with both legal and best practice requirements.

8.4 Overview of Waste Streams

The Contractor shall include the anticipated waste streams from the construction works of the Proposed Development in the RWMP.

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 Co. Co.

The quantities and volumes of all waste streams must be recorded through the course of the Proposed Development 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.

8.5 Prevention, Reuse and Recycling

8.5.1 Prevention and Preparing for Reuse

To reduce the potential impacts from materials and waste, and to achieve high levels of sustainability in the Proposed Development as a whole, the Contractor will apply the principles of the Waste Hierarchy and adopt best practice measures (BPM) which go beyond statutory compliance.

This may include BPMs set out in construction industry guidance for example, guidance from the Considerate Constructors Scheme (CCS), Waste & Resources Action Programme (WRAP) and Construction Industry Research and Information Association (CIRIA).

As outlined in the RWMP Guidelines (EPA, 2021), the RM will engage with team or individuals tasked with procurement of materials and services to ensure best practice procedures are employed to prevent residual resources at the Site. A range of good practice measures may include the following:

- Select procurement routes to minimise unnecessary packaging – for example applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage.
- Use of 'consolidation centres' to support JIT delivery – these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites.
- Implement ordering procedures and supply chain systems that avoid waste, *i.e.*, no over-ordering, use of take-back schemes for packaging, material surplus and offcuts.
- Select procurement routes that minimise unnecessary packaging.

- Plan the work sequence to reduce the potential for on-site residual resource generation.

The following approaches will be implemented, where practicable, to further minimise the quantity of waste arising and requiring disposal:

- Reuse of materials on-site wherever feasible, e.g., reuse of excavated soil for landscaping, recycling of demolition materials into aggregates.
- Off-site prefabrication, where practical, including the use of prefabricated elements.
- Segregation of waste at source, where practical, to facilitate a high proportion and high-quality recycling.
- Off-site reuse, recycling and recovery of materials and waste where reuse on-site is not practical, e.g., through use of an off-site waste segregation or treatment facility or for direct reuse or reprocessing off-site.

8.5.2 Recycling

The aim is to reuse materials won on-site by recycling them into an alternative form that can be used for construction purposes (for example crushing concrete, brick, or other inert wastes to produce aggregate material). By recycling on-site, as far as practicable, the quantity of waste requiring off-site management is reduced and carbon emissions associated with transportation are eliminated.

Recycling may also be achieved by utilising materials with a recycled content, such as recycled aggregates produced off-site.

8.5.3 Recovery

This generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities.

Recovery may also include the beneficial use of materials on land for restoration (backfilling operations).

8.5.4 Disposal

The least preferred option in the Waste Hierarchy is a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution.

When placing waste disposal contracts, the Contractor will consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles.

8.6 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 RWMP, 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.

8.7 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 C&D waste produced by the Proposed Development:

The Contractor will set out include design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:

- Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse.
- Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material.
- Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated.
- Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.

The Contractor will implement RWMP in accordance with the EPA *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects* (EPA, 2021).

The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing, and recording waste arising on-site. Opportunities for on-site and off-site reuse, recycling and recovery of excavated material and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works. 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.

In accordance with European and Irish national policy and legislation require the waste hierarchy (**Figure 8.1**) to will be applied to all waste arisings.

The RWMP submitted with the planning application (Appendix A16.1, Volume 4 of the EIAR), will be updated by the Contractor and will set out any monitoring required to be undertaken during the construction phase to ensure that the mitigation measures embedded in the Proposed Development, and those considered essential to mitigate the effects of construction activities, are appropriately implemented.

8.8 Legal Compliance

No waste will leave the 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 the 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.

8.8.1 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. Environmental Mitigation Measures

The construction of the Proposed Development 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 mitigation measures. In addition to these measures, the Contractor is required to comply with all the mitigation measures that will be outlined within the EIAR 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 Proposed Development.

9.1.1 Outline of Potential Environmental Procedures

- Training and Awareness (Section 7).
- Record Keeping, Auditing and Monitoring.
- Environmental Complaints Procedure (Section 6.2.3).
- Cultural Heritage – Archaeology and Architectural Control Plan (Section 9.2.2).
- Biodiversity Control Plan (Section 9.2.3)
- Surface Water Management / Discharge Control Plan (Section 9.2.4).
- Environmental Emergency Response Plan (Section 9.2.5).
- Ground (Soil) Control Plan (Section 9.2.6).
- Resource and Waste Management Plan (Section 8 and Section 9.2.7).
- Visual (Maintenance & Housekeeping) Control Plan (Section 9.2.8).
- Air Quality and Dust Minimisation Management Plan (Section 9.2.9).
- Noise and Vibration Management Plan (Section 9.2.10).
- Resource Usage Control Plan (Section 9.2.11).
- Sensitive Neighbours Plan (Section 9.2.12).
- Landscape 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 Contractor's / final 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 Measures – Environmental Control Plans

9.2.1 General Mitigation Measures

This section sets out the embedded impact avoidance and additional mitigation, enhancement and management measures to be included as a minimum in the Contractor’s CEMP. **Table 9.1** outlines the general mitigation measures.

Table 9.1: General Mitigation Measures

No.	Control Measures
Gen_1	A construction management team will be onsite for the duration of the construction. This team will supervise the construction of the Proposed Development, including monitoring the Contractors performance to ensure that the proposed construction phase mitigation and monitoring measures are implemented, and that construction impacts and nuisance are minimised.
Gen_2	Kerry Co. Co. will be notified of the identified point of contact onsite for the duration of the construction phase.
Gen_3	Construction signage will be provided for the Site. Signage at the Site entrance will be provided to outline details of the project and will include a contact telephone number for the public.
Gen_4	Construction phase traffic will be managed such that the impact on public roads will be minimised. This will be achieved by the implementation of the CTMP which will be agreed by Kerry Co. Co. in advance of the works.
Gen_5	The CEMP is designed to minimise any perturbations caused during the construction and is designed to meet best practice guidance and latest legislation. Specific roles, such as the Environmental (Ecological) Clerk of Works (ECoW), will be designated in the CEMP. The CEMP will be updated a minimum of every six months over the duration of the construction process.
Gen_6	The Site compound will be located away from watercourses and the storage of all fuels and potential contaminants on-site will be done so in adherence to the mitigation measures outlined within this EIAR.
Gen_7	Pedestrian access to the foreshore will be maintained throughout the construction period.
Gen_8	During construction, the excavation and grading of all areas will be carried out in a sensitive manner to marry in the new formations with the existing landscape. Sharp ridges or overly steep embankments will be avoided where possible.
Gen_9	Periodic water quality monitoring will be carried out at points of supply.
Gen_10	Some of the units for the Power Plant could be ‘extra-large loads’ / abnormal indivisible load (AIL) 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. This will be managed in accordance with the CTMP and the Abnormal Indivisible Load (AIL) Assessment, refer to Appendix A11.1 and A11.2, respectively, Volume 4.
Gen_11	The Contractor will be obliged to put measures in place during the construction phase to ensure that there are no interruptions to existing services. When service suspensions are required during the construction phase, reasonable prior notice will be given to the residents in the area. The disruption to services or outages will be carefully planned so the duration is minimised.
Gen_12	The CEMP will set out information on the roles and responsibilities of key individuals, including the environmental management and reporting structure.
Gen_13	Landscape will be reinstated in accordance with a landscape reinstatement plan.

9.2.2 Cultural Heritage - Archaeology and Architectural Control Plan

Pre-construction environmental surveys will be undertaken in advance of the enabling works. An extensive programme of pre-development licensed archaeological testing will be undertaken in the areas of the Site which will be subject to development.

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), **Table 9.2** outlines the specific mitigation measures are proposed for the archaeological sites located within the Site.

Table 9.2: Cultural Heritage Mitigation Measures

No.	Control Measures
CH_1	<p>There is one archaeological asset located within the boundary of the Site. This is the ringfort (KE003-004) / CH10 which is located on the north-east boundary.</p> <p>The 2007 EIS recommended that this asset remain in situ within the boundaries of the previous proposed development with a buffer zone created around it. This recommendation was included as Condition 32 (f) of Planning Permission (08.PA0002).</p> <p>A fence, located 30 m from the asset, will be included in the current Proposed Development as embedded mitigation.</p> <p>During the construction phase procedures will be adopted to protect this asset. These procedures could include physically cordoning the asset off from works and holding toolbox talks to inform construction supervision staff and site operatives of the requirements.</p>
CH_2	<p>A site of archaeological potential was recorded during the marine geophysical survey in 2007. The location of the submerged anomaly lies some 815 m to the north-east of the Proposed Development and is unlikely to be directly impacted by works during construction. Condition 32 (d) of previous Planning Permission (08.PA0002) which relates to this site of archaeological potential required a seabed impact exclusion zone of 50 m to be maintained around the anomaly to ensure it is not impacted upon.</p>
CH_3	<p>A survey did detect eight anomalous features (A1-8) all of which are located within the jetty footprint associated with a previous planning application.</p> <p>A8 is located 390 m to the north-east of the Outfall Pipe and is unlikely to be directly impacted by works during construction. However, it is recommended that a seabed impact exclusion zone of 50 m be maintained around the anomaly to ensure it is not impacted upon.</p>
CH_4	<p>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.</p>
CH_5	<p>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.</p>
CH_6	<p>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.</p>
CH_7	<p>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.</p>

No. Control Measures

CH_8	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.
CH_9	If previously not recorded archaeological material is found during monitoring, then consultations must be held with a certified Archaeologist and the National Monuments Service (NMS) with regard to any necessary mitigation measures. These measures may involve excavation of the archaeology.
CH_10	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.
CH_11	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.
CH_12	Works will be planned and managed to prevent any damage to local structures.

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 stormwater Outfall Pipe 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 DCHG / 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.

9.2.3 Biodiversity Control Plan

There are a number of designated sites located in the surrounding area including the Lower River Shannon Special Area of Conservation (SAC), the Ballylongford proposed Natural Heritage Area (pNHA) and the River Shannon and River Fergus Estuaries Special Protection Area (SPA).

The Proposed Development includes the installation of an outflow pipe that extend into the Lower River Shannon SAC 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.

The designated sites are by definition internationally / nationally important for their habitats and / or the species they support. Mitigation and monitoring measures (of relevance in respect of any potential ecological effects) will be implemented throughout the construction phase, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- CIRIA. Masters-Williams *et al.*, (2001). Control of water pollution from construction sites. Guidance for consultants and contractors (C532).
- CIRIA. Murnane, *et al.*, (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.
- IFI (2016). *Guidelines on protection of fisheries during construction works in and adjacent to waters*.

The Contractor's CEMP will be prepared and implemented with the objective of keeping environmental impacts to a minimum, including mitigation measures in the EIAR, NIS and any planning conditions.

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 works and good-practice construction measures will reduce the risk from impacts so that the likelihood of impacts is best described as low.

Table 9.3: Biodiversity - General Mitigation Measures

No.	Control Measures
B_01	At a minimum the oil spill response equipment will include the following: absorbent mats, waste- bags, oil splash goggles, gloves and vinyl or rubber shoe covers to protect the user from the harmful effects of the spilled material.
B_02	Imported backfill material will be washed (cleaned) to remove fines and checked for invasive species before use.
B_03	Clean (washed) rock material will be used as rock protection to minimise the risk of introducing fine materials.
B_04	All construction staff, including all sub-contracted workers, be notified of the boundaries of these Natura 2000 sites and 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.
B_05	Site managers, foremen and workforce, including all subcontractors, will be suitably trained in pollution risks and preventative measures.
B_06	<p>All staff and subcontractors have the responsibility to:</p> <ul style="list-style-type: none"> • Understand the importance of avoiding pollution onsite, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact. • Respond in the event of an incident to avoid or limit environmental impact. • Report all incidents immediately to the project manager and the Environmental (Ecological) Clerk of Works (ECoW). • Monitor the workplace for potential environmental risks and alert the site manager if any are observed. • Co-operate as required, with site inspections.

9.2.3.1 Marine Ecology

The accidental release of sediment and chemical pollutants during the construction phase for the Proposed Development may impact habitats and species immediately adjacent to, and upstream and downstream.

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 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 and 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. The loss of habitats and associated flora and fauna pending decommissioning and removal of the outfall is Negligible, and will not result in significant effects.

Activities associated with the construction phase have the potential to impact fish and marine mammals by introducing sound into the marine environment.

Table 9.4: Marine Ecology – Underwater Noise Mitigation Measures

No.	Control Measures
B_07	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.
B_08	MMO training: Use trained and experienced marine mammal observers – the guidance states this should be a visual observer who has undergone formal marine mammal observation and distance estimation training (<i>JNCC MMO training course or equivalent</i>) and also has a minimum of 6 weeks full-time marine mammal survey experience at sea over a 3-year period in European waters.
B_09	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.

9.2.3.2 Terrestrial Ecology

There will be a direct loss of terrestrial habitats within the Site. 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.

Any works close to the boundary of the Site and near the protected sites will require the development of a detailed method statement.

9.2.3.2.1 Bridge and Culvert Construction

Bridge construction on the Ralappane Stream will use a single span, pre-cast concrete bridge near the southern boundary of the Site. Two drainage ditches within the Site will be culverted. In addition to the general measures described above, the specific mitigation measures in **Table 9.5** will be implemented for crossing of the Ralappane Stream and drainage ditch.

9.2.3.2.2 Lighting

Lighting associated with the Proposed Development works could cause disturbance / displacement of fauna. If of sufficient intensity and duration, there could be impacts on reproductive success.

Construction works will take place largely during 7:30 to 18:00 Monday to Friday and 8:00 to 14:00 on Saturday. It is likely that a number of continuous construction phase works will also be required outside these hours on a limited number of occasions. Where Site lighting is required during construction, the mitigation measures are detailed in **Table 9.5**.

9.2.3.2.3 Habitats

The Wildlife Act 1976, as amended, provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from 1st March to 31st August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. If works are carried out during the breeding season, a pre-construction survey will be carried out by the ECoW and if birds are detected appropriate mitigation measures will be implemented. Where

possible, vegetation will be removed outside of the breeding season and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided.

Particular care will be taken at the boundary between the Site and the SAC, SPA and pNHA so that construction activities do not cause damage to habitats in this area. These habitats will be securely fenced off early in the construction phase. Habitat mitigation measures are detailed in **Table 9.5**.

The Ralappane Stream runs from the Site through the SAC and pNHA to the estuary, it is important that construction activities do not result in pollution of the Ralappane Stream, either through siltation, which interferes with water flow, vegetation growth and aquatic fauna, or pollution (e.g. chemical). Refer to **9.2.4** for further details on mitigation and monitoring measures for water.

9.2.3.2.4 Badgers

The Proposed Development will require exclusion of Badgers from subsidiary / outlier setts, however in both instances both social groups of Badgers would be expected to continue to use their main setts. Badger mitigation measures are detailed in **Table 9.5**.

9.2.3.2.5 Bats

During the Site works, general mitigation measures for bats will follow the National Road Authority's (NRA) '*Guidelines for the Treatment of Bats during the Construction of National Road Schemes*' (2005) and '*Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25*' (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that will be met in the pre-construction (site clearance) stage to minimise negative effects on roosting bats or prevent avoidable effects resulting from significant alterations to the immediate landscape.

A small night roost for Lesser Horseshoe Bats and a small Common Pipistrelle roost was recorded in a complex of farm buildings southwest of the Site. These buildings will not be affected by the Proposed Development. Two structures are located within the Site boundary and these will be demolished. However, no bat roosts were recorded within these structures. Mitigation measures will be agreed with the National Parks and Wildlife Services (NPWS).

A number of trees will be removed prior to construction. Although mature trees with the potential of be of value as bat roosts are absent from the Site. Bat mitigation measures are detailed in **Table 9.5**.

9.2.3.2.6 Otters

No signs of Otter or Otter holts were noted within 150 m of the Site however Otter was recorded along the Ralappane Stream and to the west of the Site. Otter mitigation measures are detailed in **Table 9.5**.

9.2.3.2.7 Common Frog

Common frog mitigation measures are detailed in **Table 9.5**.

9.2.3.2.8 Birds – Breeding and Estuarine Birds

No signs of nesting birds were recorded in buildings at the Site during the 2023 breeding bird surveys. Bird (breeding and estuarine) mitigation measures are detailed in **Table 9.5**.

9.2.3.3 Biodiversity and Landscape Plan

Details of the landscaping plan for the Proposed Development are included in **Figure F2.4** in Volume 3 of the EIAR and drawing submitted with the planning application. This includes detailed areas of native woodland and native scrub habitat as well as native wildflower planting. Refer to **Table 9.5**.

Table 9.5: Terrestrial Mitigation Measures

No.	Control Measures
Bridge and Culvert Construction	
B_10	Works will comply with The IFI's Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016).
B_11	No instream works will take place in the Ralappane Stream.
B_12	Appropriate silt control measures such silt barriers (e.g. straw or silt fence) will be employed where required.
B_13	Construction activities will be undertaken during daylight hours only (i.e. 7:30 to 18:00 Monday to Friday and 8:00 to 14:00 on Saturday). This will ensure that there is potential for undisturbed fish passage at night. The works will be temporary and will not create a significant long-term barrier to fish movement.
B_14	An appropriate native wildflower mix as determined by the ECoW based on ground conditions, will be utilised to re-vegetate any disturbed areas along the bank of the Ralappane Stream.
B_15	Although no Common Frog were observed in drainage ditches within the Site boundary, they will be surveyed prior commencement of site works by the ECoW as a precautionary measure. Any Common Frog, if recorded, will be moved to suitable habitat in the wider landscape under licence from NPWS.
Lighting	
B_16	Site lighting will be provided by tower mounted temporary portable construction floodlights.
B_17	The floodlights will be cowed and angled downwards to minimise spillage to surrounding habitats. Lighting mitigation measures will follow Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010).
B_18	Lighting will be provided with the minimum luminosity necessary for safety and security purposes. Where possible, lighting will be restricted to the working area and using the cowl and angling noted above, will minimise overspill and shadows on sensitive habitats outside the construction area.
B_19	During construction, lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact at the SAC / SPA boundary, the Ralappane Stream as well as hedgerows, treelines along the boundary of the Site.
B_20	There will be no directional lighting focused towards these areas and cowl and focusing lights downwards will minimise light spillage.
Habitats	
B_21	It is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from 1 st March to 31 st August.
B_22	Particular care will be taken at the boundary between the Site and the SAC, SPA and pNHA so that construction activities do not cause damage to habitats in this area. These habitats will be securely fenced off early in the construction phase. The fencing will be clearly visible to machine operators.
B_23	To prevent incidental damage by machinery or by the deposition of spoil during site works, hedgerow, tree and scrub / woodland vegetation which are located in close proximity to working areas will be clearly marked and fenced off to avoid accidental damage during excavations and site preparation. The ECoW will specify appropriate protective fencing where required.
B_24	Habitats that are damaged and disturbed will be reinstated and landscaped once construction is complete. Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.
B_25	Native woodland and shrub planting will include Scot's Pine, Willow, Oak, Alder, Rowan, Hazel, Blackthorn and Holly. Native wildflower mixes will provide a variety of flowers to encourage biodiversity. Wildflower seed mixes will be from 100% native Irish provenance and sourced within Ireland. The overall site will undergo seeding once, and then will be left to naturally recolonise. Natural regeneration of vegetation will also occur.
B_26	There will be a defined working area which will be fenced off with designated haul routes to prevent inadvertent damage to adjoining habitats.
B_27	Tree root systems can be damaged during site clearance and groundworks. Materials, especially soil and stones, can prevent air and water circulating to the roots. No materials will be stored within the root

No. Control Measures

	protection area / dripline of trees earmarked for retention. The ECoW will specify appropriate protective fencing where required.
	Badgers
B_28	Prior to construction works, the ECoW will obtain a derogation licence from the NPWS if required, to facilitate licenced exclusion of Badgers from Sett 1 (if active) and Sett 2 in accordance with a plan approved by the NPWS.
B_29	The destruction of a successfully evacuated Badger sett may only be conducted under the supervision of qualified and experienced personnel under licence, if required, from the NPWS. The possibility of Badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with Badgers within the sett or any Badgers injured during sett destruction.
B_30	Badger sett tunnel systems can extend up to approximately 20 m from sett entrances. Therefore, no heavy machinery should be used within 30 m of Badger setts (unless carried out under licence); lighter machinery (generally wheeled vehicles) should not be used within 20 m of a sett entrance; light work, such as digging by hand or scrub / vegetation clearance should not take place within 10 m of sett entrances.
B_31	During the breeding season (December to June inclusive), none of the above works should be undertaken within 50 m of active setts nor blasting within 150 m of active setts. Affected Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage.
B_32	The most recent surveys show that the two main Badger setts are located outside of the Site boundary and the two setts to be directly affected are subsidiary setts. The bait marking survey indicates that the setts are linked as follows: <ul style="list-style-type: none">• Sett 4 (main sett) is located to the east of the Proposed Development. Sett 1 is located within the Site boundary. These setts are used by the same social group.• Sett 3 (main sett) is located to the east of the Proposed Development. Sett 2 is located within the Site boundary. These setts are used by the same social group.
B_33	A methodology for the exclusion of Badgers from affected setts and displacement of Badgers to artificial setts is outlined in the National Roads Authority's publication <i>Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes</i> (NRA 2005a). Detailed mitigation and monitoring measures including method statements will be agreed with the NPWS prior to implementation.
B_34	Prior to the commencement of works, setts will be surveyed by the ECoW to determine current usage patterns.
B_35	Exclusion of Badgers from any currently active sett will only be carried out during the period of July to November (inclusive) in order to avoid the Badger breeding season.
B_36	In the instance of disused setts or setts verified as inactive, and to prevent their reoccupation, the entrances may be lightly blocked with vegetation and a light application of soil (soft blocking). The purpose of soft-blocking is to confirm that an apparently inactive sett is not occupied by Badgers. If all entrances remain undisturbed for approximately five days, the sett should be destroyed immediately using a mechanical digger, under the supervision of the licensee. Should there be any delay in sett destruction, the soft-blocked entrances should be hard-blocked and the sett destroyed as soon as possible, again under the supervision of the licensee. Hard-blocking is best achieved using buried fencing materials and compacted soil with further fencing materials laid across and firmly fixed to blocked entrances and surrounds.
B_37	Where field signs or monitoring reveal any suggestion of current or recent Badger activity at any of the sett entrances, the sett requires thorough evacuation procedures.
B_38	Inactive entrances may be soft and then hard-blocked, as described for inactive setts, but any active entrances should have one-way gates installed (plus proofing around sides of gates) to allow Badgers to exit but not to return. The gates should be tied open for three days prior to being set to exclude. Sticks should be placed at arm's length within the gated tunnels to establish if Badgers remain within the sett.
B_39	Gates should be left installed, with regular inspections, over a minimum period of 21 days (including period with gates tied open) before the sett is deemed inactive. Any activity at all will require the procedures to be repeated or additional measures taken. Gates might be interfered with by other mammals or members of the public - hence the importance of regular exclusion monitoring visits. Sett destruction should commence immediately following the 21-day exclusion period, provided that all Badgers have been excluded.

No. Control Measures

B_40	Where an extensive sett is involved, an alternative method of evacuating Badgers is to erect electric fencing around the sett (ensuring all entrances are included) with one-way Badger-gates installed within the electric fence at points where the fence crosses Badger paths leading to and from the sett. The exclusion should again take place over a minimum period of 21 days before sett destruction; this monitoring period would be contingent upon no Badger activity being observed within the fenced area. Fencing may not be practical in many situations due to the topography or the terrain – and can be difficult to install effectively. If no activity is observed, then the sett may be destroyed, under supervision by the ECoW.
B_41	Destruction is usually undertaken with a tracked 12-25 tonne digger, commencing at approximately 25m from the outer sett entrances and working towards the centre of the sett, cutting approximately 0.5 m slices in a trench to a depth of 2 m. Exposed tunnels may be checked for recent Badger activity, with full attention paid to safety requirements in so doing. The sett should be destroyed from several directions, in the above manner, until only the central core of the sett remains.
B_42	Once it is ensured that no Badgers remain, the core may then also be destroyed and the entire area back-filled and made safe. Sett excavation should, preferably, be concluded within one working day, as Badgers may re-enter exposed tunnels and entrances.
B_43	A report detailing evacuation procedures, sett excavation and destruction, and any other relevant issues will be submitted to the NPWS.
B_44	Construction activities within the vicinity of affected setts may commence once these setts have been evacuated and destroyed under licence (if required) from the NPWS. Where affected setts do not require destruction, construction works may commence once recommended alternative mitigation measures to address the Badger issues have been complied with.
B_45	Badger access points will be provided to allow Badgers to access the development area once complete (See NHBS, 2021 or similar). Gates will be placed within fences along the western, eastern and southern boundaries to maximise potential usage by the different social groups that occur within this area.
B_46	Monitoring of Badger setts will be carried out during construction works and a five-year post-construction monitoring programme will be implemented.
Bats	
B_47	In all cases immediately in advance of demolition a bat specialist will undertake an examination of the building. If bats are present at the time of examination it is essential to determine the nature of the roost (i.e. number, species, whether it is a breeding population) as well as its exact location.
B_48	If bats are recorded in buildings earmarked for demolition, special mitigation measures to protect bats will be put in place and a license to derogate from the conservation legislation will be sought from the NPWS prior to the commencement of demolition works.
B_49	The contractor will take all required measures to ensure works do not harm individuals by altering working methods or timing to avoid bats, if necessary.
B_50	If roosting habitat for bats is removed, replacement habitat will be provided.
B_51	The bat specialist will work with the contractor to ensure that the loss of trees is minimised and that trees earmarked for retention are adequately protected.
B_52	Tree-felling of mature trees will ideally be undertaken in the period September to late October / early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
B_53	Felled trees will not be mulched immediately. Such trees will be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. The bat specialist will be on-hand during felling operations to inspect felled trees for bats. If bats are seen or heard in a tree that has been felled, work will cease and the local NPWS Conservation Ranger will be contacted.
B_54	Tree will be retained where possible and no 'tidying up' of dead wood and spilt limbs on tree specimens will be undertaken unless necessary for health and safety.
B_55	Treelines outside the Proposed Development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.
B_56	During construction directional lighting will be employed to minimise light spill onto adjacent areas. Where practicable during night-time works, there will be no directional lighting focused towards

No. Control Measures

watercourses or boundary habitats and focusing lights downwards will be utilised to minimise light spillage.

B_57 If bats are recorded by the bat specialist within any trees no works will proceed without a relevant derogation licence from the NPWS.

B_58 As a biodiversity enhancement measure it is proposed that bat boxes will be put up within the Site. It is proposed that eight bat boxes will be located within the overall site (see Wildcare, 2021 for box proposed or similar). The boxes will be erected by the ECoW taking into account landscape plans, vehicle movements and lighting.

B_59 Lighting mitigation measures will follow *Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers* (Bat Conservation Ireland, 2010). Refer to **Section 9.2.3.2.2**.

B_60 All mitigation measures including detailed method statements will be agreed with the NPWS prior to commencement of works, which could affect any bat populations onsite.

Otters

B_61 A detailed pre-construction survey will be carried out no more than 10-12 months prior to the commencement of construction works to confirm the absence of Otter holts within 150 m of the Site.

B_62 If Otter holts are recorded at that time, the ECoW will determine the appropriate means of minimising effects *i.e.* avoidance, moving works, timing of works etc. If required the ecologist will obtain a derogation licence from the NPWS, to facilitate licenced exclusion from the breeding or resting site in accordance with a plan approved by the NPWS.

B_63 Any holts found to be present will be subject to monitoring and mitigation as set out in the NRA publication *Guidelines for the Treatment of Otter prior to the Construction of National Road Schemes* (2008).

B_64 If found to be inactive, exclusion of holts may be carried out during any season. No wheeled or tracked vehicles (of any kind) will be used within 20 m of active, but non-breeding, Otter holts.

B_65 Light work, such as digging by hand or scrub / vegetation clearance will also not take place within 15 m of such holts, except under licence. The prohibited working area associated with Otter holts will be fenced and appropriate signage erected.

B_66 Where breeding females and cubs are present no evacuation procedures of any kind will be undertaken until after the Otters have left the holt, as determined by the ECoW. Breeding may take place at any season, so activity at a holt must be adjudged on a case-by-case basis.

B_67 On occasion, Otter holts may be directly affected by the scheme. To ensure the welfare of Otter, they must be evacuated from any holts present prior to any construction works commencing. The exclusion process, if required, involves the installation of one-way gates on the entrances to the holt and a monitoring period of 21 days to ensure the Otters have left the holt prior to removal.

Common Frog

B_68 A visual search of the wet grassland habitat and drainage ditches to be removed will be carried out in the days prior to commencement of works and any frogs will be removed to alternative wet grassland habitat elsewhere within the landholding. This will be carried out under licence from the NPWS and under supervision of the ECoW.

Breeding Birds

B_69 Prior to demolition buildings will be checked for nesting Swallows (and other birds). If nesting birds are recorded, all demolition operations will be carried out between October and March, when birds have finished breeding.

B_70 Vegetation will be removed outside of the breeding season and in particular, removal during the peak-breeding season (April-June inclusive) will be avoided. This will also minimise the potential disturbance of breeding birds outside of the Site boundary.

B_71 As a biodiversity enhancement measure ten bird nesting boxes (various types) will be located within the Site boundary at locations specified by the ECoW. It is noted that provision of woodland planting and the use of native wildflower planting will provide additional nesting and feeding sites for birds, particularly as these habitats mature.

Estuarine Birds

No. Control Measures

B_72	A detailed method statement will be drawn up by the ECoW and agreed with the NPWS prior to commencement of works. The method statement will specify the timing of blasting operations and the need, if any, for ecological supervision.
Biodiversity and Landscaping Plan	
B_73	The woodland planting mix will be dominated by native species including Scots Pine <i>Pinus sylvestris</i> , Willow, Pedunculate Oak <i>Quercus robur</i> and Sessile Oak <i>Quercus petraea</i> , Alder, Rowan <i>Sorbus</i> spp. and Crab Apple <i>Malus</i> spp. The woodland edge planting mix will include Hazel <i>Corylus</i> spp., Hawthorn, Blackthorn, Elder <i>Sambucus</i> spp. and Holly <i>Ilex</i> spp.
B_74	A linear strip of woodland along the southern boundary will help to maintain connectivity (east to west) between habitats in the wider landscape.
B_75	Additional native specimen trees (Willow, Wild Cherry <i>Prunus avium</i> , Rowan, Whitebeam <i>Sorbus subg. Aria</i> and Silver Birch) will be planted on peripheral areas such as the road edge and administration area.
B_76	A native wildflower mixes (of 100% Irish provenance) will be utilised to provide a more diverse sward which is of higher ecological value for invertebrates and birds. Native wildflower mixes will provide a variety of flowers to encourage biodiversity. Wildflower seed mixes will be from 100% native Irish provenance and sourced within Ireland. The overall site will undergo seeding once, and then will be left to naturally recolonise. Perennial Rye Grass or other vigorous amenity/ agricultural grass species will not be utilised as they tend to over-dominate the sward and reduce overall biodiversity. The final wildflower mix will be specified by the ECoW based on final ground conditions including alkalinity, fertility and moisture levels.
B_77	Based on the seed mix utilised and on prevailing ground conditions, the ECoW will specify the management regime, including weed control and mowing regime, necessary to maximise biodiversity and habitat value.
B_78	Five insect nesting boxes suitable for <i>Hymenoptera</i> spp. (bees and wasps) will be put in place within the Site boundary as a biodiversity enhancement measure.

9.2.3.4 Invasive Species

The Birds and Natural Habitats Regulations 2011 (S.I. No. 477 of 2011), Regulation 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed (*Fallopia japonica*), as follows: “any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [...] shall be guilty of an offence.”

A survey for invasive species was carried out in conjunction with habitat surveys 2022-2024 and any observations of invasive species made during other surveys were recorded. No third schedule invasive species were recorded within the Site boundary (Wildlife Act 1976, as amended) or any High impact or Medium impact invasive species as classified by the NBDC were recorded within the Site.

Prior to the commencement of construction works an invasive species survey will be undertaken within the Site boundary by a competent ecologist to determine if invasive species listed under Part 1 of the Third Schedule of S.I No. 477 of 2011 have established in the area in the period between pre-planning and post consent.

In the event that invasive species are identified within the works area a site-specific Invasive Species Management Plan will be developed and implemented by a competent specialist on behalf of the Contractor. In addition, in order to comply with *Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011)* the Contractor will ensure biosecurity measures are implemented throughout the construction phase to ensure the introduction and translocation of invasive species is prevented.

The appointed ECoW will carry out a toolbox talk which will identify invasive species and will also implement biosecurity measures such as the visual inspection of vehicles for evidence of attached plant or animal material prior to entering and leaving the works area.

9.2.4 Surface Water Management / Discharge Control Plan

During the construction phase, the mitigation measures will ensure that no sediment contamination, as a result of soil removal or compaction will enter watercourses on or near the Site.

Temporary storage of soil and stone will be carefully managed in such a way as to prevent potential negative impact on the receiving water environment, refer to **Section 9.2.6**.

The Construction Industry Research and Information Association (CIRIA) C532 *Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors* (CIRIA, 2001) is a 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 brownfield 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. 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.

9.2.4.1 Bedrock Excavation

Excavation of bedrock to 18 m OD will be below the pre-construction groundwater level in some areas of the Site and will result in discharges of groundwater from the cut faces. This will be routed via the stormwater drainage system at platform level, as described below.

9.2.4.2 Construction Dewatering

Shallow groundwater is present in the superficial deposits and bedrock at the Proposed Development, such that the water table is likely to be intercepted during excavation works and dewatering activities required to facilitate excavations for the creation of the platform area, the underground electrical connections, drainage infrastructure, as well as any foundations required for the development.

Any discharge of and any consenting requirements for the discharge of such water, following treatment, will be discussed, and agreed with Kerry Co. Co. prior to the commencement of work. Dewatering fluids will be pumped via settlement tanks or collection basins where any solids in the water will settle out.

9.2.4.3 Surface Water / Storm Water

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.

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 runoff away from the construction areas, into the nearby estuary.

Rainwater runoff will be treated to prevent sediment from entering the estuary. Discharge water quality targets will be agreed with Kerry Co. Co. and included in the Contractor's CEMP.

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.

9.2.4.4 Pre-Earthworks Drainage

Pre-earthworks drainage mitigation will be implemented, refer to **Table 9.6**.

Table 9.6: Pre-Earthworks Drainage and Surface Water Drainage Mitigation

No.	Control Measures
SWM_1	To prevent the risk of contaminating surface water and groundwater, temporary surface water drainage (including dewatering measures) and silt ponds will be constructed to control runoff from the earthworks stage.
SWM_2	Drains carrying high sediment load will be diverted through silt ponds, located between the construction area and the surface water outfall.
SWM_3	Surface water runoff from working areas will not be allowed to discharge directly to the local watercourses or to the estuary.
SWM_4	This will flow through a filtration system (such as hay bales) to slow down flow to an acceptable level. Silt traps will be placed at crossing points to avoid siltation of watercourses.
SWM_5	Attention will be paid to preventing the build-up of dirt on road surfaces, caused by lorries and other plant entering and exiting the Site, via wheel washes and road sweepers as required. The layout of the temporary surface water drainage system will incorporate the mitigation and monitoring measures outlined in this EIAR and conform to the requirements of the CEMP, RWMP, CTMP, Natura Impact Statement (NIS) and planning conditions.
SWM_6	Rainwater runoff will be diverted away from the construction areas into the Shannon Estuary.
SWM_7	Rainwater runoff will pass through an attenuation system including ponds with straw bales or silt bags to prevent sediment from entering the estuary.
SWM_8	Discharge water quality targets will be agreed with Kerry Co. Co. and included in the Contractor's CEMP.
SWM_9	Regular water inspection and sampling regimes will be put in place via the Contractor's CEMP on the foreshore during construction activity onsite to monitor compliance with the discharge conditions.
SWM_10	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.
SWM_11	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.
SWM_12	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.

No. Control Measures

SWM_13	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.
SWM_14	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.
SWM_15	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 user.
SWM_16	Vehicles and equipment will not be left unattended during refuelling operations. Regular inspection and maintenance measures for 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.
SWM_17	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 road 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 will not cross any existing watercourse.
SWM_18	All watercourse crossings will be planned in accordance with applicable guidelines and in consultation with Inland Fisheries Ireland. No permanent watercourse diversions are proposed as part of the Proposed Development.
SWM_19	The access road will be designed to conduct road runoff to an engineered swale adjacent to the west side of the road.
SWM_20	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 Power Plant area in the north of the Proposed Development.
SWM_21	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 Site, via wheel washes and road sweepers as required.
SWM_22	During the construction phase there is a risk of loss of hydrocarbons from vehicles and plant involved in construction activities and subsequent hydrocarbon.
SWM_23	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.

9.2.4.5 Fuel and Chemical Handling

Construction phase mitigation will be implemented to prevent spillages to ground of fuels, and to prevent any consequent soil, groundwater or surface water quality impacts, refer to **Table 9.7**.

Table 9.7: Fuel and Chemical Handling Mitigation

No. Control Measures

SWM_24	Designating a bunded storage area at the contractor's compound for all oils, solvents and paints used during construction. Oil and fuel storage tanks will be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area. Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled, so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the Proposed Development, a suitably-sized spill pallet will be used for containing any potential spillages during transit.
SWM_25	Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in a designated area, which will be away from surface water gullies or drains. Spill kit facilities will be provided at the fuelling area in order to provide for accidental releases or spillages in and around the area. Any used spill kit materials will be appropriately disposed of using a hazardous waste contractor.

No. Control Measures

SWM_26	Where mobile fuel bowzers are used on the Proposed Development in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve will be fitted with a lock where it leaves the tank and locked shut when not in use. The pump or valve will also have a lock and be locked shut when not in use. Each bowser will carry a spill kit and each bowser operator will have spill response training.
SWM_27	All equipment and machinery will be checked for leaks and other potential sources of contaminants before arriving on-site and on a daily basis. Any equipment or machinery likely to introduce to contaminants will not be brought on-site or will be removed from the Site immediately if any leak is discovered. Spill kits will be available to machine operators, and they will be trained in their use.
SWM_28	The storage of hazardous substances will be necessary during construction. Fuel will be stored at least 50 m from a waterbody and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.

9.2.4.6 Sources of Aggregates and Clean Fill for the Proposed Development

While it is anticipated the Proposed Development will have a net zero cut / fill balance, there is potential for small quantities of clean fill materials to be required to facilitate construction works, for example where site-won soils or crushed rock are not of sufficient geotechnical or chemical quality for re-use. The source of this fill material will be vetted in order to ensure that it is of a reputable origin and that it is 'clean' (*i.e.*, will not introduce contamination to the groundwater or surface water environment). All potential suppliers will be vetted for the following criteria:

- Environmental management status.
- Regulatory and legal compliance status of the company.

Clean fill material will be sourced from local suppliers which comply with the above requirements. If recycled aggregate is used as imported fill, rigorous chemical testing will be undertaken to confirm that it is 'clean' (*i.e.* will not introduce contamination to the environment).

9.2.4.7 Foul Sewer

Foul water will arise from the Site offices, canteens, toilets and showers. The foul water will be collected in tanks and self-contained toilet units for removal by road tanker by a licensed haulier to a licensed 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.

9.2.4.8 Flood Risk

Table 9.8 outlines the flood risk mitigation measures for protection of watercourses from flooding.

Table 9.8: Flood Risk Mitigation

No. Control Measures

SWM_29	During the construction phase, the Contractor will monitor weather forecasts on a monthly, weekly, and daily basis, and plan works accordingly. The Contractor will describe in the Site ERP the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.
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No. Control Measures

SWM_30	Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 50m from the edge of the SAC. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.
SWM_31	Construction material(s), demolition materials and plant / welfare will not to be stored in the flood extents or elevated to minimise the impacts of flooding.
SWM_32	All temporary works within the flood extents will be designed taking into account a flood impact loading and where possible, the Contractor will choose materials and / or equipment that are flood compatible to minimise the risk if a flood were to occur during any construction works.
SWM_33	Continuous monitoring of weather conditions and tidal levels including surges will be completed throughout the works period.

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 measured shall include as a minimum:

Table 9.9: Environmental Emergency Response Mitigation

No. Control Measures

EE_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.
EE_2	A 'Spill Incident' includes: Drips, Stains, Spillage, or Release of any liquid (including oils, soiled water, sewage, paints, resins, cement and chemicals).
EE_3	All materials and spill-risk activities will be restricted to the least sensitive part of site, greatest distance from surface waters, drainage, etc.
EE_4	All plant and equipment will be mechanically sound, and operated and maintained in accordance with the manufacturer written recommendations to prevent oil leaks.
EE_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.
EE_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.
EE_7	Only properly certified, self-bunded metal units will be used for storage of fuel on-site.
EE_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.
EE_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).
EE_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.
EE_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.
EE_12	All bunded facilities will be subject to routine inspection to ensure integrity.
EE_13	Only approved fuel containers (jerry cans) will be used to hold smaller volumes of fuel.

No. Control Measures

EE_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.
EE_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.
EE_16	The Contractor will 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.

9.2.5.1 Control of Concrete and Lime

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 any waterbody. 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.

Table 9.10: Concrete and Lime Mitigation Measures

No. Control Measures

CL_01	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, to surface water courses or to the marine environment.
CL_02	The pouring of concrete will take place within designated areas as required, using a geosynthetic material to prevent concrete runoff into the soil.
CL_03	The Construction Manager, the Environmental Manager and appropriate engineer will supervise all concrete pours.
CL_04	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.
CL_05	Washout of concrete-transporting vehicles will take place at an appropriate facility offsite where possible. Alternatively, where washout takes place onsite, it will be carried out in carefully-managed onsite wash out areas.
CL_06	Ready-mixed concrete will be either produced onsite in a batching plant or brought to the Proposed Development by truck.
CL_07	Rainwater will be diverted away from the construction areas into the estuary or nearby ditches and streams. Water from construction areas will be filtered and treated to prevent sediment from entering surface waters. A regular water sampling regime will be put in place for the D1, D2 and D3 streams and the Surface Water Outfall on the Site and other potentially-impacted runoff points to the shoreline during construction activity onsite. Water samples will be taken at specified locations to be agreed with the local authority.

9.2.6 Ground (Soil) Control Plan

Construction works will be undertaken in accordance with the following environmental management technical guidance documents:

- CIRIA (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*.
- CIRIA (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.
- CIRIA (2023). *Environmental Good Practice on site pocketbook (C811)*.
- EPA (2021). *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects*.

Table 9.11: Land, Soil and Geology General Mitigation Measures

No.	Control Measures
LSG_1	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 Kerry Co. Co.
LSG_2	In the event that short-term c. 24-48 hr. storage is required the material will be retained in a designated stockpile storage area identified on the relevant site layout drawings.
LSG_3	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. It's envisaged no excavated material will leave site.
LSG_4	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. Should any unusual staining or odour be noticed, this soil will be segregated and samples of this soil analysed for the presence of possible contaminants in order to determine an appropriate disposal outlet.
LSG_5	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.
LSG_6	Temporary surface water drainage (including dewatering measures) and silt ponds will be constructed to control runoff from the earthworks stage.
LSG_7	A Surface Water Management Plan will be prepared and any construction-related requirements imposed as conditions of any planning permission granted. It will include details of proposed environmental monitoring for the duration of the construction works, be this good practice or as a planning condition requirement.
LSG_8	Soils, pile arisings and crushed rock will be tested for their chemical and geotechnical suitability prior to use as fill. Fill placement and compaction will be undertaken in line with defined procedures and will be inspected by a geotechnical engineer.
LSG_9	Prior to commencement of the Proposed Development, site investigation results will be used to inform the geotechnical design. Foundation solutions will be designed based on the properties of the underlying soils and bedrock, appropriate methodologies will be selected for the excavation of bedrock and foundation design will be finalised. Where necessary and in accordance with industry best practise, further detailed site investigation will be undertaken to provide design parameters for the Proposed Development.

9.2.6.1 Soil Removal and Compaction

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 runoff to soils. 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 following mitigation measures that will be implemented during the construction phase.

Table 9.12: Soil Removal and Compaction Mitigation Measures

No.	Control Measures
LSG_10	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.
LSG_11	Of this 35,000 m ³ of topsoil, 13,745 m 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.
LSG_12	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.
LSG_13	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 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 Site.
LSG_14	Segregate different grades of soil where they arise and topsoil will first be stripped from any land to be used for storing subsoil.
LSG_15	Minimise movements of materials within the stockpiles in order to reduce the degradation of the soil structure.
LSG_16	Maintain an even inclined surface on cut and fill surfaces to prevent the formation of ruts and hollows (which may promote ponding).
LSG_17	Defer final shaping and trimming of formation levels until immediately prior to placement of surface dressing.
LSG_18	Undertake earthworks in glacial till in times of dry weather, where possible. Manage groundwater and surface water flows through drainage channels.
LSG_19	All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, this soil will be segregated and samples of this soil analysed for the presence of possible contaminants in order to determine an appropriate disposal outlet.
LSG_20	While it is anticipated all excavated materials will be re-used on-site for the Proposed Development, 26,000 tonnes of aggregate will be brought to site. The source of this fill material will be vetted in order to ensure that it is of a reputable origin and that it is 'clean' (<i>i.e.</i> , will not introduce contamination to the environment). All potential suppliers will be vetted for the following criteria: <ul style="list-style-type: none"> • Environmental management status. • Regulatory and legal compliance status of the company.
LSG_21	Clean fill material will be sourced from suppliers which comply with the above requirements. If recycled aggregate is used as imported fill, rigorous chemical testing will be undertaken to confirm that it is 'clean' (<i>i.e.</i> , will not introduce contamination to the environment).
LSG_22	It is recommended that earthworks be undertaken in dry weather, where possible, in view of the sensitivity of the overburden to moisture content. For the same reason, it is recommended even, inclined surfaces be maintained on cut and fill surfaces to prevent rutting and water pooling.

9.2.7 Resource and Waste Management Plan (RWMP)

A RWMP has been prepared for the Proposed Development, refer to Appendix A16.1, Volume 4 of the EIAR. Procedures for the storage and management of hazardous wastes are set out in the RWMP which will be implemented by the appointed Contractor and that Contractor will update the RWMP, where necessary, to comply with planning conditions and in agreement with Kerry Co. Co.

Table 9.13: Resource and Waste Management Mitigation Measures

No.	Control Measures
RW_1	Waste materials will be required to be temporarily stored onsite pending collection by a waste contractor.
RW_2	The Contractor will endeavour to ensure that material is reused or recovered offsite insofar as is reasonably practicable or disposed of at authorised facility.
RW_3	The RWMP will establish a waste recording system to test and track all waste loads going offsite for appropriate disposal. This includes Waste Acceptance Testing (WAC) to determine the appropriate disposal route for the waste.
RW_4	The RWMP will also contain details of waste permits and hauliers who will be authorised to remove waste from the Site and it will detail waste audits to be carried out.
RW_5	<p>The RWMP include design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:</p> <ul style="list-style-type: none"> • Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse. • Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material. • Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated. • Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.
RW_6	The Contractor will be required to develop a detailed RWMP that complies with the EPA (2021) ' <i>Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Waste Projects</i> '.
RW_7	The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing, and recording waste arising on-site. Opportunities for on-site and off-site reuse, recycling and recovery of excavated material and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works.
RW_8	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.
RW_9	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.
RW_10	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.
RW_11	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.
RW_12	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.
RW_13	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.

9.2.8 Landscape and Visual (incl. Maintenance & Housekeeping) Control Plan

Visual mitigation measures during the construction please include the following:

- Existing tree protection measures during construction shall be carried out in accordance with BS 5837:2012.
- Minimise external lighting related to construction works.
- Regular cleaning of public roads to remove any track out and to reduce temporary to short-term effects on visual amenity.

9.2.8.1 Visual (Maintenance & Housekeeping) Control Plan

Table 9.14: Maintenance & Housekeeping Mitigation Measures

No.	Control Measures
LV_01	Parking will be only permitted at designated areas.
LV_02	The entire site including all site offices, accommodation and storage facilities will be maintained in a safe, clean and organised condition throughout the project.
LV_03	A regular program of site tidying will be established to ensure a safe and orderly site
LV_04	Access and exit routes will be kept clear at all times.
LV_05	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.
LV_06	Scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind.
LV_07	Food waste will be strictly controlled on all parts of the Site.
LV_08	Loaded lorries and skips will be covered with plastic sheeting and tied down.
LV_09	Internal haul roads will be paved at the earliest possible opportunity and inspected regularly for cleanliness.
LV_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.
LV_11	Road edges and footpaths will be cleaned using a hand broom with controlled damping.
LV_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/SAC.
LV_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
LV_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.
LV_15	Keys for mobile plant and equipment will be retained in a secure location during times that they are not in use.
LV_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.
LV_17	All site areas will be appropriately designated and clearly signposted (materials storage, waste compound area, etc.).
LV_18	Only good quality signage will be posted. These will be replaced as deemed necessary by the Contractor.
LV_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.

No. Control Measures

LV_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.
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9.2.9 Air Quality and Dust Minimisation Management Plan

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. Refer to Sections 6.2.3 and 9.2.12.

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.
- 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.

The list of IAQM recommended Dust (and particulate matter) mitigation measures will be implemented at the Site are set out in **Table 9.15**.

Table 9.15: Air and Dust Mitigation Measures

No. Control Measures

AQ_1	Develop and implement a stakeholder communications plan that includes community engagement before work commences onsite
AQ_2	Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary.
AQ_3	Display the head or regional office contact information.
AQ_4	Develop and implement a Dust Management Plan (DMP).
AQ_5	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
AQ_6	Record any exceptional incidents that cause dust and / or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
AQ_7	Undertake daily onsite and offsite inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked.
AQ_8	Carry out regular site inspections to monitor compliance with the DMP, record inspection results.

No. Control Measures

AQ_9	Increase the frequency of site inspections by the person accountable for air quality and dust issues onsite when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
AQ_10	Agree a proportionate level of Site boundary dust monitoring, relative to the risk of offsite dust impacts occurring and the potential for harm to amenity, with the Planning Authority. This could include passive dust deposition monitoring at potential locations shown on Figure 9.1 , the data gathered by which could be used to inform the effectiveness of dust control measures and substantiate potential complaints.
AQ_11	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
AQ_12	Erect solid screens / barriers or enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period.
AQ_13	Keep site fencing, barriers and scaffolding clean using wet methods.
AQ_14	Cover, seed or fence long-term stockpiles to prevent wind whipping.
AQ_15	Ensure all vehicles switch off engines when stationary - no idling vehicles.
AQ_16	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
AQ_17	Impose and signpost maximum-speed-limits on surfaced and unsurfaced haul roads and work areas.
AQ_18	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
AQ_19	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression technique.
AQ_20	Ensure an adequate water supply on the Site for effective dust / particulate matter suppression / mitigation.
AQ_21	Use enclosed chutes and conveyors and covered skips.
AQ_22	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment if it is fitted.
AQ_23	Ensure equipment is readily available onsite to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
AQ_24	Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable, or Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
AQ_25	Only remove vegetation cover in small areas during work and not all at once.
AQ_26	Avoid scabbling (roughening of concrete surfaces) if possible.
AQ_27	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out.
AQ_28	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery.
AQ_29	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
AQ_30	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.
AQ_31	Avoid dry sweeping of large areas.
AQ_32	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
AQ_33	Inspect onsite haul routes for integrity, make a record and instigate necessary repairs to the surface as soon as reasonably practicable.
AQ_34	Install hard surfaced haul routes, which are regularly damped down.
AQ_35	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable). Ensuring that there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever Site size and layout permits.

No. Control Measures

AQ_36	Access gates to be located at least 10 m from receptors where possible.
AQ_37	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
AQ_38	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.
AQ_39	Earthworks and exposed areas/ soil stockpiles will be revegetated to stabilise surfaces if at all practical and as soon as practicable.
AQ_40	Internal haul roads will be paved at the earliest possible opportunity and inspected regularly for cleanliness.
AQ_41	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.
AQ_42	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. .
AQ_43	Public roads outside the site and off-site areas will be regularly inspected for cleanliness, and cleaned as necessary.
AQ_44	Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
AQ_45	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.
AQ_46	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/SAC.
AQ_47	Road edges and footpaths will be cleaned using a hand broom with controlled damping.

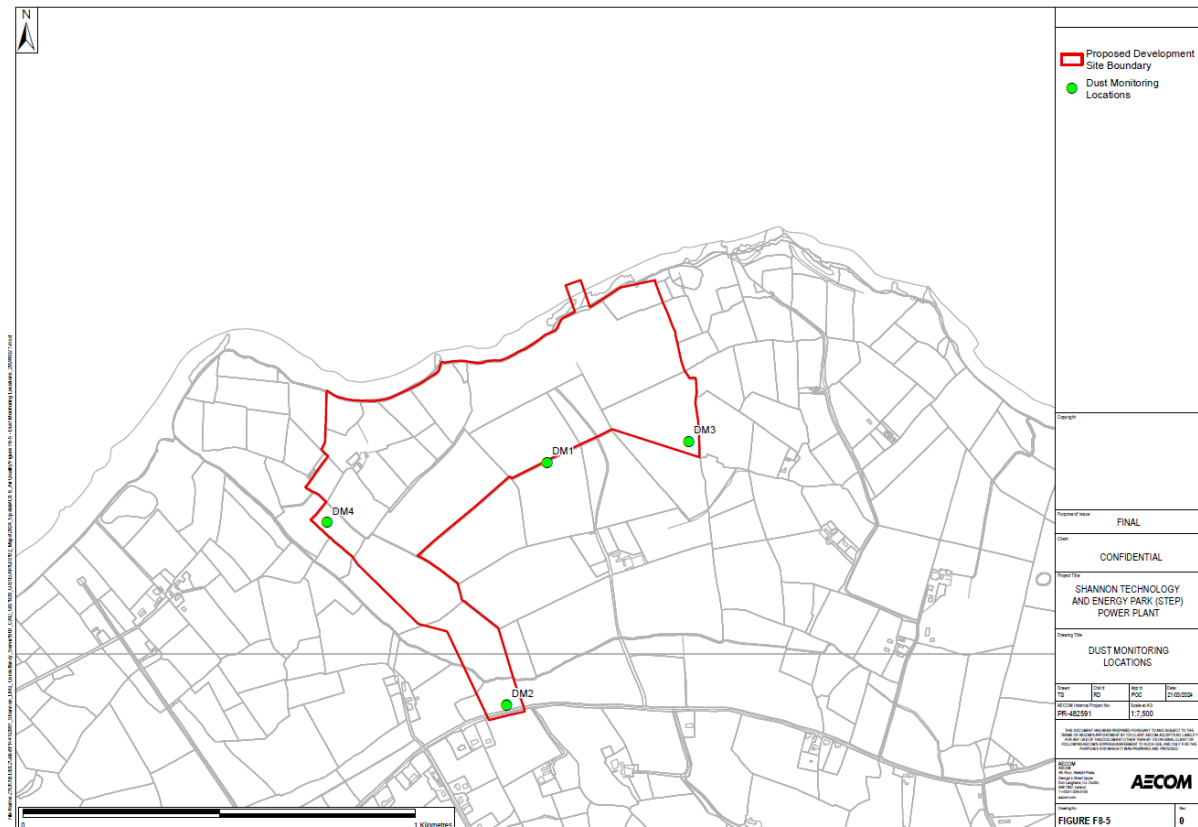


Figure 9.1: Dust Monitoring Locations

9.2.10 Noise and Vibration Control Plan

The construction phase is expected to last approximately 32-months. During this period sound and vibration levels are expected to vary depending on the work being carried out.

Sound levels will be highest during the initial enabling phase whilst louder activities such as earthworks take place. As the construction phase develops, sound levels are expected to reduce as less noisy works (plant installation, internal works within structures) take over.

Vibration levels are expected to be highest during blasting operations, however these will be carefully managed. No more than one blast is envisaged to occur in any given day and associated noise and vibration levels will be transient and very short lived.

Approximately three to four long-term noise monitoring stations and one to two long-term vibration monitors will be set up on the Site boundary. The exact location of these stations will be determined at detailed design 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 at detailed design.

Any noise complaints received during the construction phase will be investigated thoroughly. The results of the investigation, including measured noise and vibration levels at the time of the complaint, onsite activities and any corrective action taken, will also be reported to relevant stakeholders.

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.

Maximum Permissible Noise Levels at the Façade of Dwellings During Construction

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

Potential construction noise impacts can also be assessed using *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'* (BS5228).

Construction Noise Criteria

Assessment category and threshold value period	Threshold Value $L_{Aeq,T}$ dB		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 - 19:00) & Saturdays (07:00 - 13:00)	65	70	75

NOTE 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

NOTE 3: Applies to residential receptors only.

(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

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.*
- *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*.

To ensure sound and vibration levels are kept to a minimum and to reduce the risk of cumulative impacts, the measures in **Table 9.16** will be adopted during the construction phase:

Table 9.16: Noise and Vibration Mitigation Measures

No.	Control Measures
NV_1	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.
NV_2	Fixed and semi-fixed ancillary plant such as generators, compressors and pumps shall be located away from sensitive receptors wherever possible.
NV_3	All plant used onsite shall be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.
NV_4	All noise generating construction plant shall be shut down when not in use.
NV_5	The loading and unloading of materials shall take place away from residential properties, ideally in locations which are acoustically screened.
NV_6	Materials shall be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant shall be kept to a minimum.
NV_7	Modern plant shall be selected which complies with the latest European Commission noise emission requirements. Electrical plant items (as opposed to diesel powered plant items) shall be used wherever practicable. All major compressors shall be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers.
NV_8	Site operations and vehicle routes shall be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography.
NV_9	No employees, subcontractors and persons employed on the site shall cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site shall include information on minimising noise and reminding them to be considerate of the nearby residents.
NV_10	As far as practicable, noisier activities shall be planned to take place during periods of the day which are generally considered to be less noise sensitive i.e. not particularly early or late in the day.
NV_11	Measures shall be put in place to ensure that employees know that minimisation of noise will be important at the Site.
NV_12	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.
NV_13	A regime of noise and vibration monitoring will be undertaken during the construction phase to determine compliance with the nominated criteria and to provide a feedback mechanism so that corrective action can be taken in the event of exceedances.
NV_14	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.
NV_15	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.
NV_16	Machines, which are used intermittently, will be shut down or throttled back to a minimum during those periods when they are not in use.
NV_17	Any plant, such as generators or pumps, which are required to work outside of normal working hours, will be surrounded by an acoustic enclosure.
NV_18	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.

No.	Control Measures
NV_19	Any tests or procedures which are known to be potentially noisy will be carried out during daytime hours only.
NV_20	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.
NV_21	Construction plant and equipment will comply with, EC (Construction Plant and Equipment) (Permissible Noise Level) Regulations.
NV_22	Noise monitoring is to be conducted during critical periods and at sensitive locations to be agreed in consultation with the Kerry Co. Co.
NV_23	Throughout the contract, the supervision of the works will include ensuring compliance with the limits using the methods set out in BS:5228

9.2.10.1 Blasting Mitigation

It is expected that limited 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, and in a controlled manner to minimize the noise and ground vibrations.

No more than one blast is envisaged to occur in any given day and associated noise and vibration levels will be transient and very short lived.

With regard blasting operations BS5228 states:

Whenever blasting is carried out, energy is transmitted from the blast site in the form of airborne pressure waves. These pressure waves comprise energy over a wide range of frequencies, some of which are higher than 20 Hz and therefore perceptible as sound, whereas the majority are below 20 Hz and hence inaudible but can be sensed as concussion. It is the combination of the sound and concussion that is known as air overpressure.

With regard air overpressure criteria, BS5228 goes on to state:

As the airborne pressure waves pass any single point the pressure of the air rises rapidly to a value above atmospheric pressure, falls to below atmospheric pressure, then returns to normal pressure after a series of oscillations. The maximum value above atmospheric pressure is known as peak air overpressure and is measured in pressure terms and generally expressed in linear decibels (dB lin) (see I.4).

Routine blasting can regularly generate air overpressure levels at adjacent premises of around 120 dB (lin). This level corresponds to an excess air pressure which is equivalent to that of a steady wind velocity of 5 m·s⁻¹ (Beaufort force 3, gentle breeze) and is likely to be above the threshold of perception.

Windows are generally the weakest parts of a structure and research by the United States Bureau of Mines [65] has shown that a poorly mounted window that is prestressed might crack at 150 dB (lin), with most windows cracking at around 170 dB (lin), whereas structural damage would not be expected at levels below 180 dB (lin).

Criteria for vibration caused by blasting activities are presented in BS6472-2:2008 Guide to evaluation of human exposure to vibration in buildings, Part 2: Blast Induced Vibration (BSI Group, 2008) (BS6472).

BS6472 Vibration Criteria - Blasting

Place	Time	Satisfactory Magnitude ^A PPV (mm/s)
Residential	Day ^D	6.0 to 10.0 ^C
	Night ^D	2.0
	Other Times ^D	4.5
Offices^B	Any Time	14.0
Workshops^B	Any Time	14.0

NOTE 1 This table recommends magnitudes of vibration below which the probability of adverse comment is low (noise caused by any structural vibration is not considered).

NOTE 2 Doubling the suggested vibration magnitudes could result in adverse comment and this will increase significantly if the magnitudes are quadrupled.

NOTE 3 For more than three occurrences of vibrations per day see the further multiplication factor in 5.2.

A) The satisfactory magnitudes are the same for the working day and the rest of the day unless stated otherwise.

B) Critical working areas where delicate tasks impose more stringent criteria than human comfort are outside the scope of this standard.

C) Within residential properties people exhibit a wide variation of tolerance to vibration. Specific values are dependent upon social and cultural factors, psychological attitudes and the expected degree of intrusion. In practice the lower satisfactory magnitude should be used with the higher magnitude being justified on a case-by-case basis.

D) For the purpose of blasting, daytime is considered to be 08h00 to 18h00 Monday to Friday and 08h00 to 13h00 Saturday. Routine blasting would not normally be considered on Sundays or Public Holidays. Other times cover the period outside of the working day but exclude night-time, which is defined as 23h00 to 07h00.

It is understood that no more than one blast per day is envisaged (a prerequisite for the Error! Reference source not found. criteria to apply).

The blasting vibration limits will be achieved by limiting the Maximum Instantaneous Charge (MIC) used in the blasting process. To determine the MIC for the Site, a number of trial blasts will be carried out such that a site-specific scaled distance graph can be developed. Using this graph, the MIC limit required to achieve the criteria can be determined in accordance with the procedure detailed in BS6472.

To minimise and to reduce the impacts from blasting, the measures in **Table 9.17** will be adopted during the construction phase.

Table 9.17: Blasting Mitigation Measure

No.	Control Measures
NVB_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.
NVB_2	Ensuring appropriate burden to avoid over or under confinement of the charge.
NVB_3	Accurate setting out and drilling.
NVB_4	Appropriate charging.
NVB_5	Appropriate stemming with appropriate material such as sized gravel or stone chippings.
NVB_6	Using delay detonation to ensure smaller maximum instantaneous charges (mics).
NVB_7	Using decked charges and in-hole delays.
NVB_8	Blast monitoring to enable adjustment of subsequent charges.
NVB_9	Designing each blast to maximize its efficiency and reduce the transmission of vibration.
NVB_10	Avoiding the use of exposed detonating cord on the surface in order to minimise 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.

No. Control Measures

NVB_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.
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9.2.11 Resource Usage Control Plan

Construction materials will be sourced locally from authorised quarries, where possible to minimise the environmental impact of transportation. It is intended that this will include all suitable stone recovered on during the enabling works will be reused as hardcore. on during the enabling works will be reused as hardcore. For this purpose, rock crushing and screening plant will be provided. Additional rock, stone and sand materials could be procured from local quarries as required including the following:

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

All the materials will be transported to the Site by road. It is anticipated that up to 26,000 tonnes of imported aggregates will be required for the Proposed Development.

Some of the process equipment and structural elements will arrive onsite as complete units or sub-assemblies, which may be larger than normal construction loads. It is anticipated that all the units will be delivered by ship to Foynes, and from there transported to the Site by road. Some of the units could be ‘extra-large loads’ / abnormal indivisible load (AIL) 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. This will be managed in accordance with the CTMP and the Abnormal Indivisible Load (AIL) Assessment, refer to Appendix A11.1 and A11.2, respectively, Volume 4 of the EIAR.

Resource mitigation measures are included in **Table 9.18**.

Table 9.18: Resource Mitigation Measures

No. Control Measures

R_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.
R_2	Site safety and waste management will benefit from more efficient management of site materials.
R_3	Signage will be visible in appropriate site areas to serve as a reminder of resource usage to all site staff
ENERGY and UTILITIES	
R_4	During the construction phase of the Proposed Development, electricity will be supplied via a series of portable site units prior to the medium voltage electricity connection becoming available.
R_5	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.
R_6	Electrical Meter will be installed to monitor all electrical consumption for the duration of the project.
R_7	All diesel used for the duration of the works will be logged.
R_8	Documents will be emailed instead of photocopying where possible.

No. Control Measures

R_9	As with any excavations there is a potential to disrupt local underground services. A confirmatory survey of all existing services will be carried out prior to construction and identify the precise locations of any services.
R_10	The Contractor will be obliged to put measures in place during the construction phase to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority. When service suspensions are required during the construction phase, reasonable prior notice will be given to the residents in the area. The disruption to services or outages will be carefully planned so the duration is minimised. The timing of local domestic connections will be addressed between the Contractor and the local community at the detailed design stage.
R_11	All potential temporary connections will be agreed in advance with the relevant service provider.
R_12	All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers / authorities (<i>i.e.</i> , ESB, GNI, Eir, Virgin Media and any others of relevance). These works will be carried out in a manner that is safe, and which avoids or minimises interruptions of service which might affect local residents and businesses and adjacent development.
R_13	Works during the construction phase, including service diversions and realignment will be carried out in accordance with relevant guidance documents, including GNI's publication ' <i>Safety advice for working in the vicinity of natural gas pipelines</i> '; the ESB's ' <i>Code of Practice for Avoiding Danger from Overhead Electricity Lines</i> ', and the Health and Safety Authorities (HSA) ' <i>Code of Practice for Avoiding Danger from Underground Services</i> '.
R_14	All new infrastructure will be installed in accordance with the applicable standards, guidelines and codes of practice.
R_15	Periodic water quality monitoring at point of supply.
TRAVEL	
R_16	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.
R_17	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.
MATERIALS	
R_18	Printers will be set to print on both sides of paper.
R_19	Reuse of site won material will be promoted. Excavated soil will be reused on site wherever possible to reduce the need for imported fill.
R_20	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.
R_21	Material purchasing will include full specification of materials for just-in-time delivery. Unused materials will be returned to supplier on agreement.
R_22	Work will be planned to prevent waste of materials.
R_23	Material storage and movement will be well organised to prevent damage and waste.
R_24	Unnecessary materials will be promptly removed from site for reuse where possible.
WATER	
R_25	Water will be required for consumption by the construction personnel, for general construction works, hydrotesting of tanks and pipework, for the construction of the concrete elements, and for wheel wash facilities and dust suppression.
R_26	It is anticipated that water supply for the construction phase will be obtained from a water main along the L1010 road. The Applicant has submitted a pre-connection agreement application to Uisce Éireann for this supply. If this supply is not available, water will be delivered by road and stored in a temporary tank onsite. The maximum potable water demand for construction will be 98 m ³ /day.
R_27	The Proposed Development will incorporate water efficiency measures such as collection of grey water to minimise water consumption as far as possible.

No. Control Measures

R_28	All water supply will be maintained and fitted with stop taps.
R_29	Water meters will be installed to monitor all water consumption for the duration of the project.
R_30	Water will be reused onsite where possible, for example grey water will be used for wheel washing activities.

9.2.12 Sensitive Neighbours Plan

Table 9.19: Sensitive Neighbours Mitigation Measures

No. Control Measures

SN_1	The Contractor will respect all site neighbours by proactively addressing any concerns.
SN_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.
SN_3	Examination period will be taken in consideration in the programming of the works.
SN_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.
SN_5	The Construction Traffic Management Plan (CTMP) 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.

