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Volume 2 - Environmental Impact Assessment Report

Moneypoint Security of Supply

February 2024

Electricity Supply Board

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Moneypoint Security of Supply

Environmental Impact Assessment Report

February 2024

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Contents

Tables

Figures

Photos

Glossary

A-weighting	The human ear also has a non-linear frequency response, being most sensitive in the frequency range 1 kHz to 4 kHz and is less sensitive at higher and lower frequencies. The A-weighting is a frequency function commonly applied to the linear output of a microphone to simulate the subjective response of the ear. A-weighted levels are usually indicated by a subscript A or postscript (A).
Ambient Sound Level $L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
A-weighted equivalent continuous noise level $L_{Aeq,T}$	The A-weighted equivalent continuous noise level, $L_{Aeq,T}$, is the notional level of a steady sound which, at a given position and over the same period of time (T), would deliver the same sound energy as the fluctuating one. Used to quantify time-varying noise from industrial sources.
Background Sound Level $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels
Carbon Budget	An amount of carbon dioxide that a country, company, or organisation has agreed is the largest it will produce in a particular period of time.
Climate Change	Changes in general weather conditions over 30 years (seasonal averages and extremes).
Competent Authority	The authority charged with examining an Environmental Impact Assessment Report (EIAR) with a view to issuing a consent and includes the Minister, public or statutory body or public authority to which the EIAR is required to be submitted in support of a Development Permission application.
Construction Compound	A temporary facility to be used during the Construction Phase for the storage and marshalling of bulk materials and equipment as well as welfare facilities for construction personnel.
Construction Phase	This Phase includes the physical building of the proposed development including site preparation and access works, establishment of construction compounds as well as installing infrastructure for the proposed development. Some commissioning activities may be undertaken during this Phase including testing and certification.

Decibel	Sound and noise are commonly described using the decibel (dB) scale, which is logarithmic in nature to relate to the response of the human ear. The range of human hearing commonly varies from the threshold of audibility (0 dB) to the threshold of pain (120 dB). Such limits are seldom experienced in practice and typical levels might vary between 30 dB in a quiet bedroom at night to 90 dB at the kerbside of a busy road.
Decommissioning Phase	This is the final closing and putting the proposed development into a state of safety when it comes to the end of its operational life.
EirGrid	EirGrid is the state-owned independent Transmission System Operator (TSO). EirGrid develops and operates Ireland's national high voltage electricity grid (also called the "Transmission System"). This brings power from where it is generated to where it is needed, throughout Ireland. EirGrid is also expected to be the new offshore Transmission Asset Owner (TAO)
Electricity Supply Board Networks (ESBN)	ESBN is the Transmission Asset Owner (TAO), including assets associated with the existing potential connection points.
Environmental Impact Assessment Report (EIAR)	A report prepared by the Applicant to describe the likely significant effects of a project and submitted to the Competent Authority with a Development Permission application.
European Sites	Sites both onshore and offshore which are designated for conservation and protection under the EU Habitats Directive.
Greenhouse Gas Emissions (GHGs)	Greenhouse Gases (GHGs) refer to the seven gases covered by the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3). These are measured in units of carbon dioxide equivalent (CO_2e).
Natura Impact Statement (NIS)	This is a report prepared to inform an Appropriate Assessment (AA) of Natura 2000 sites as required under the EU Habitats Directive which presents information on the assessment and the process of collating data on a project and its potential significant impacts on European site(s).
The Applicant	Electricity Supply Board (ESB)
The Proposed Development	MoneyPoint Security of Supply Project

Abbreviations

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AAP	Areas of Archaeological Potential
ABP	An Bord Pleanála
ACA	Architectural Conservation Area
AEP	Annual Exceedance Probability
AER	Annual Environmental Report
AGI	Above Ground installation
AIRO	All-Island Research Observatory
AMSL	Above Mean Sea Level
AOD	Above Ordnance Datum
AQS	Air Quality Standards
ASA	Ash Storage Area
Avg.	Average
BAT	Best Available Technique
BaU	Business as Usual
BC	Before Christ
BC	Baseline Concentrations
BCT	Bat Conservation Trust
BPEO	Best Practicable Environmental Option
Bq/m³	Becquerels per cubic meter

BS	British Standard
BSA	Biologically Sensitive Area
C&D	Construction and Demolition
CAP	Climate Action Plan
CBAM	Carbon Border Adjustment Mechanism
CBD	Convention on Biological Diversity
CEMS	Continuous Emissions Monitoring System
CH	Cultural Heritage
CH_4	Methane
CHIA	Cultural Heritage Impact Assessment
CIEEM	Chartered Institute for Ecology and Environmental Management
CIfA	Chartered Institute of Archaeologists
CLC	CORINE Land cover
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
CRU	Commission for Regulation of Utilities
RWMP	Construction Resource and Waste Management Plan
CSO	Central Statistics Office
DAHGI	Department of Arts, Heritage, Gaeltacht and the Islands
dB	Decibel

DMP	Decommissioning Management Plan
DoHLGH	Department of Housing, Local Government and Heritage, formerly Department of Housing, Planning and Local Government (DHPLG)
EC	European Commission
ED	Electoral Division
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELV	Emission Limit Value
EMP	Environmental Management Plan
EnCoW	Environmental Clerk of Works
END	Environmental Noise Directive
EPA	Environmental Protection Agency
EQS	Environmental Quality Standards
ESB	Electricity Supply Board
ESBN	ESB Networks
ETS	Emission Trading Scheme
EU	European Union
EU ETS	European Union's Emissions Trading Scheme
EUPHA	European Public Health Association
EV	Electric Vehicle
FGD	Flue Gas Desulphurisation
FRA	Flood Risk Assessment
G.L.	Ground Level
GHG	Greenhouse Gas

GLVIA	Guidelines for Landscape and Visual Impact Assessment
GNI	Gas Networks Ireland
GPS	Global Positioning System
GSI	Geological Survey Ireland
HAS	Health and Safety Authority
HDV	Heavy Duty Vehicles
HFCs	Hydrofluorocarbons
HFO	Heavy Fuel Oil
HGV	Heavy Goods Vehicles
HVL	High Value Landscape
IAA	Irish Aviation Authority
IAQM	Institute of Air Quality Management
IE	Industrial Emissions
IED	Industrial Emissions Directive
IEL	Industrial Emission License
IEMA	Institute of Environmental Management and Assessment
IFI	Inland Fisheries Ireland
IUCN	International Union for Conservation of Nature
IW	Irish Water
IWEA	Irish Wind Energy Association
IWDG	Irish Whale and Dolphin Group
I-WeBS	Irish Wetland Bird Survey
KER	Key Ecological Receptors

km	Kilometre
kV	Kilovolt
kWh	Kilowatt-hour
$L_{A90,T}$	The A-weighted sound pressure level in dB exceeded for 90% of the time period T
$L_{Aeq,T}$	The A-weighted Leq, measured over a specified period of time (T)
LAP	Local Area Plan
LCA	Landscape Character Area
LCT	Landscape Character Type
LDV	Light Duty Vehicles
Lg	Locally Important Aquifer– Sand and gravel
LGV	Light Goods Vehicles
LIA	Landscape Impact Assessment
LiDAR	Light Detection and Ranging
LV	Low Voltage
LVIA	Landscape & Visual Impact Assessment
m	metre
MCPD	Medium Combustion Plant Directive
m/s	Metres per Second
mg/l	Milligram per Litre
mm/s	Millimetres per second
Mt	Metric ton
MV	Medium Voltage
MW	Mega Watts

N_2O	Nitrous oxide
NBDC	National Biodiversity Data Centre
NECP	National Energy and Climate Plan
NF_3	Nitrogen Trifluoride
NHA	Natural Heritage Area
NH_3	Ammonia
NIAH	National Inventory of Architectural Heritage
NIS	Natura Impact Statement
NLCD	National Land Cover Database
nm	Nautical Mile
NO_2	Nitrogen Dioxide
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
NSL	Noise Sensitive Locations
NTS	Non-Technical Summary
O_3	Ozone
OLM	Ozone Limiting Method
OPW	Office of Public Works
OSI	Ordnance Survey Ireland
OWMS	Operational Waste Management Strategy
PEC	Predicted Environmental Concentrations
PFC	Perfluorocarbons
PM	Particulate Matter

pNHAs	proposed Natural Heritage Areas
PS	Protected Structure
PSDP	Project Supervisor Design Process
QI	Qualifying Interest
RBMP	River Basin Management Plan
RMP	Record of Monuments and Places
RPO	Regional Policy Objective
RPS	Record of Protected Structures
RSES	Regional Economic and Spatial Strategy
SAC	Special Area of Conservation
SAPS	Small Area Population Statistics
SCI	Special Conservation Interest
SF_6	Sulphur hexafluoride
SID	Strategic Infrastructure Development
SMR	Sites and Monuments Records
SO_2	Sulphur Dioxide
SOx	Sulphur Oxides
SPA	Special Protection Area
TCM	Targeted Contracting Mechanism
TEGP	Temporary Emergency Generation Power Plant
TII	Transport Infrastructure Ireland
TSO	Transmission System Operator
TTA	Traffic and Transport Assessment

UBH	Unregistered built heritage site
UCH (1)	Unregistered cultural heritage site that comprises extant remains
UCH (2)	Unregistered cultural heritage site that does not comprise extant remains
UNFCCC	United Nations Framework Convention on Climate Change
VRP	Viewshed Reference Points
WAM	With Additional Measures
WEM	With Existing Measures
WFD	Water Framework Directive
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Project Overview

Mott MacDonald Ireland Limited (Mott MacDonald) have been appointed by the Electricity Supply Board to prepare and lodge a planning application for the continued generation and associated change of fuel type used (ie from coal to Heavy Fuel Oil [HFO]) of Moneypoint Generating Station. The Electricity Supply Board, hereafter referred to as ESB or 'the Applicant', are required to submit a strategic infrastructure development application to An Bord Pleanála under Section 37E of the Planning and Development Act 2000 (as amended) for the project.

At present Moneypoint Generating Station primarily operates as a coal fired power station. It is proposed to convert its primary fuel source to Heavy Fuel Oil (HFO) with limited run hours from late 2024 until the end of 2029 (hereafter referred to as the "proposed development"). The proposed development will act as an out of market generator of last resort and will operate only when required by the Transmission System Operator (EirGrid) for security of supply reasons.

This Environmental Impact Assessment Report (EIAR) has been prepared in support of the planning application in accordance with the requirements of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU (together, referred to as the "EIA Directive"). The planning application is submitted under Section 37 of the Planning and Development Act 2000 (as amended). The EIA Directive was implemented in Ireland by the Planning and Development Act 2000 (as amended), as well as a number of other statutory instruments i.e. Planning and Development Regulations 2001 (as amended) and European Union (Environmental Impact Assessment) Regulations 2018. This EIAR has been prepared to facilitate the competent authority, in this case An Bord Pleanála, to undertake an Environmental Impact Assessment of the proposed development.

Moneypoint Generating Station is a strategically important part of the energy generation network across Ireland and contributes to ensuring that energy needs are met nationwide, meeting on average ca.12-15% of national demand. The proposed development aims to ensure that the power station remains viable as an energy generation node until the end of 2029, whereafter ESB intends on transforming the site and redeveloping it as a hub for the offshore renewable sector as part of the ESB's 'Towards Zero' Strategy. The project also aims to deliver the phasing out of fossil fuels under the Programme for Government (2020).

1.2 About the Applicant

The ESB was established in 1927 as a statutory corporation in the Republic of Ireland under the Electricity (Supply) Act 1927. With a holding of 95%, ESB is majority owned by the Irish Government with the remaining 5% held by the trustees of an Employee Share Ownership Plan.

ESB owns and operates assets across the electricity market: from generation, through transmission and distribution to supply. In addition, ESB provides associated services such as supplying gas, using its networks to carry fibre for telecommunications and developing electric vehicle public charging infrastructure.

ESB provides approximately 43% of electricity generation capacity in the Irish all-island market and supplies electricity to approximately 1.4 million customers. ESB Group employs approximately 7,000 people.

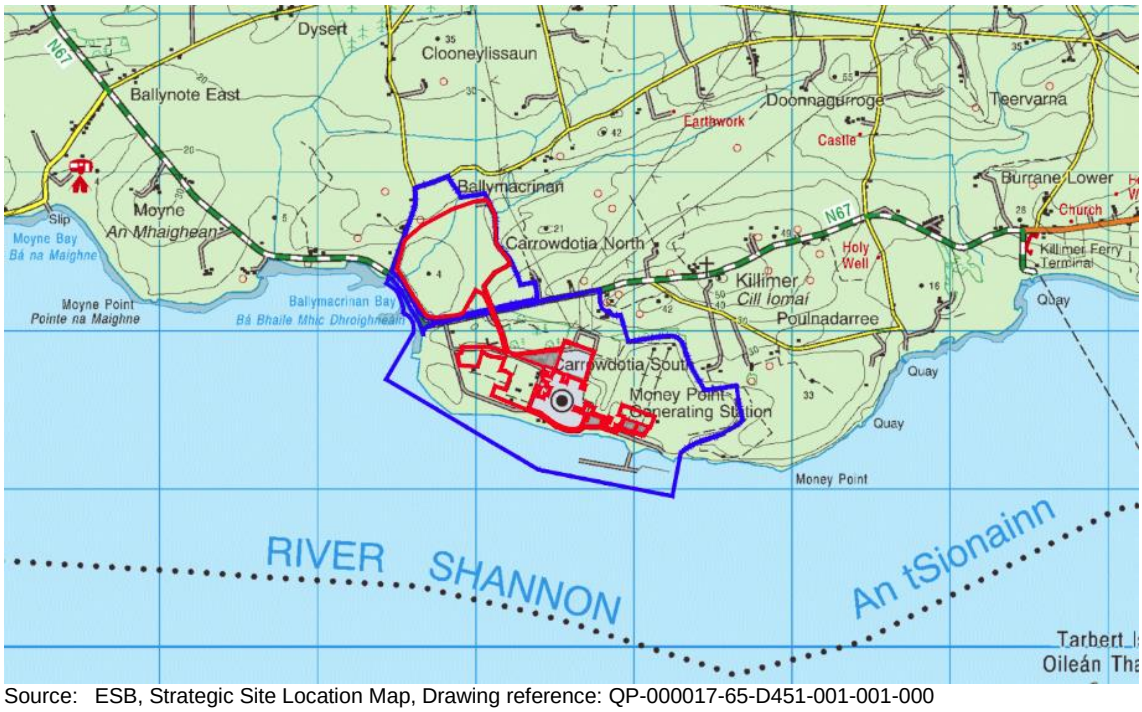
ESB's mission is to bring sustainable and competitively priced energy solutions to its customers and its vision is to be Ireland's foremost energy company competing successfully in the all-island market.

1.3 Location of Proposed Development

Moneypoint Generating Station lies on the northern shore of the [Lower] Shannon Estuary, in the townland of Carrowdotia North, Carrowdotia South and Ballymacrinan, County Clare, and is located approximately 4km southeast from Kilrush, the nearest town, and approximately 1.8km west of Killimer village. Figure 1.1 shows the strategic location of Moneypoint Generating Station.

Moneypoint Generating Station lies within a larger ESB landholding comprising approximately 180 hectares of land onshore and approximately 65 hectares within the nearshore. The extent of land above the (historic) high water mark within ESB's ownership is presented in Figure 1.1. The red line boundary indicates the planning application boundary of the proposed development whereas the blue line boundary represents ESB's ownership boundary. There are no works proposed below the (historic) high water mark (i.e. within the nearshore) as part of the proposed development.

Figure 1.1: Moneypoint Generating Station – Strategic Location Map



Source: ESB, Strategic Site Location Map, Drawing reference: QP-000017-65-D451-001-001-000

1.4 Background to Moneypoint Generating Station

Moneypoint Generating Station comprises a large complex of structures. Electricity generation occurs at three. ca. 300MW rated coal-fired units (Units 1 to 3), which entered service between 1985 and 1987. Moneypoint is primarily a coal fired station, with Heavy Fuel Oil (HFO) used as a start-up fuel and in limited other circumstances. The IE licence states that all units are dual-fired, capable of full load on coal and/or HFO firing.

Currently on site, fuel is stored in two existing HFO tanks each with a capacity of 25,000 tonnes, and two existing distillate storage tanks, each with a capacity of 300 tonnes. Therefore, the site has a cumulative HFO and distillate oil storage capacity of 50,600 tonnes. Under the Chemicals

Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations") the existing volume of fuel oil (i.e. dangerous substances) stored on-site categorises Moneypoint Generating Station as an "upper tier establishment". This classification will remain unchanged as a result of the proposed development and obliges ESB to comply with additional requirements for the prevention of major accidents involving dangerous substances, as specified in the COMAH Regulations.

Moneypoint Generating Station site is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence [Register number: P0605-04].

Throughout its operation, Moneypoint Generating Station has been maintained and improved to meet relevant environmental standards, and the IE licence has been amended or reviewed as appropriate.

Set within a rural landscape, Moneypoint is a significant brownfield landbank long associated with the generation of electricity and associated activities including fuel management, wind energy generation and electrical infrastructure.

Since its commissioning, Moneypoint has operated as a coal fuelled power station, meeting on average 12-15% of national demand. Today, the station remains an important electricity generation asset. In addition to generating capacity of ca. 900MW of electricity, it is the largest energy store on the Island with a capacity to store sufficient coal for three months of running, compared with standard gas generating stations which hold just up to five days of energy storage, as per the EirGrid Grid Code 2019[1]. As such, the site plays a consistent and key role in the energy strategies for the State. As part of the proposed development the storage capacity of HFO will therefore increase to allow full operation of all generation units on HFO. The current storage capacity is up to 10 days of operation this will increase to up to 20 days, running at full capacity.

In recent years, Moneypoint has responded to national demand for electricity, particularly during unscheduled outages of other major generating stations, the Covid-19 pandemic and the prevailing energy crisis. Generating schedules are in place up to 2024, with Moneypoint anticipated to continue to play a key role meeting national electricity demands.

ESB has long signalled its intention to cease burning coal at Moneypoint Generating Station from the end of 2025 as part of their broader strategy which commits ESB to a zero-carbon future. Furthermore, plans have been announced for the transformation of the Moneypoint site and its redevelopment as a hub for the offshore renewables sector, this project is known as "Green Atlantic @ Moneypoint". The Green Atlantic @ Moneypoint project is a multi-billion programme of significant investment to the site over the next decade, which will include a floating offshore wind farm, wind turbine construction hub and the development of green hydrogen production, storage and generation facility. There are no project interdependencies between the subject proposed development and Green Atlantic @ Moneypoint. Green Atlantic @ Moneypoint will be subject to a separate planning consent application.

[1] EirGrid Grid Code Version 8 (EirGrid, 2019)

1.5 Description of the Proposed Development

The proposed development will comprise of the following:

1. Transition and conversion of the existing coal fired power station's primary fuel from coal to Heavy Fuel Oil (HFO) for limited hours of operation and a temporary period of five years until the 31 December 2029;
2. Construction of 2no. HFO tanks each with a capacity of 25,000 tonnes (approx. 48.7m diameter x 15m H) and associated bund walls (approx. 5.0m high);
3. Construction of a new boiler house (approx. 24m L x 18m W x 11m H) to house 2no. auxiliary boilers (1no. electric and 1.no distillate, each approx. 22.7MW (thermal output), including:
   - 1no. blow down vessel (approx. 4.5m wide x 13m high)
   - 1no. exhaust Stack (approx. 1.0m diameter and 30m H)
   - 1no. annex structure (approx. 10.0m L x 5m W x 4m H)
4. Construction of an extension to each of the existing 3no. Flue Gas Desulphurisation Absorbers (FGD) - units 1, 2 and 3, to provide additional reclaimed ash unloading facilities (ash injection plant extension), comprising:
   - 1no. conveyor enclosure (approx. 7.0m L x 2.5m W x 22m H)
   - 1no. hopper enclosure (approx. 6m L x 5m W x 6m H)
5. Construction of a reclaimed ash unloading facility at the existing landfill capping batching plant, comprising a hopper enclosure adjoining the existing batching plant (approx. 14.0m L x 6.5m W x 6.0m H) and conveyor enclosure (approx. 3.5m L x 3.5m W x 11.5m H)
6. Dismantling and removal of 2no. mobile stacker reclaimers and 1no. coal conveyor bridge;
7. Changes to existing permitted Flue Gas Desulphurisation (FGD) by-product and ash storage area (ASA) arrangements (Pl. Ref. 14/373) to utilise spare capacity in the existing ASA [capping layer thickness increase from 0.6m (*minimum*) up to a maximum of 1.6m] with an overall proposed reduction in height of the currently permitted ASA by approx. 1.85m; and,
8. All associated ancillary site development works to facilitate the proposed development, including a new lighting arrangement, surface water drainage, internal roads and temporary construction compounds and laydown areas.

The proposed works do not include any changes to the generating units, beyond normal maintenance. These have been designed to fire either fully or partially with HFO. There will also be no change to the existing boilers, turbines, transformers or associated equipment. Each unit is connected to the national grid through the existing 400kV/220kV substations. No changes to the HFO forwarding systems and electricity transmission infrastructure will be required to facilitate the proposed transition to HFO. All works will occur within the ESB Moneypoint Generating Station complex. No works or changes are proposed at the existing loading jetty area.

In the interest of clarity, ESB are a private landowner of part of the maritime area which occurs at Moneypoint Generating Station, in this case 65 hectares of the nearshore as illustrated in Figure 1.1. The construction of existing Moneypoint Generating Station complex required land reclamation, as such, the historic high-water mark extends partially across the Moneypoint Generating Station complex. However, as per Section 99 of the Maritime Area Planning Act 2021 (as amended) any privately owned area of the maritime area does not require a Maritime Area Consent prior to the lodgement of a planning application.

1.6 Legislative Context

The following sections provide an overview of the legislative context relevant to the proposed development.

1.6.1 Industrial Emissions Licence

The IE licence (Register Number: P0605-04) authorises the following activities:

- Activity 1.1 (IED) / 2.1 (EPA Act 1992, as amended): “Combustion of fuels in installations with a total thermal input of 50MW or more”,
- Activity 5.4 (IED) / 11.5 (EPA Act 1992, as amended): “Landfills, within the meaning of Section 5 (amended by Regulation 11(1) of the Waste Management (Certification of Historic, Unlicensed Water Disposal and Recovery Activity) Regulations 2008 (SI. No 524 of 2008) of the Act of 1996, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25,000 tonnes, other than landfills of inert waste”.

The site also operates in line with the conditions of the applicable Greenhouse Gas Emissions (GHG) Permit (Permit Register Number IE-GHG070-10381-6).

It is not proposed to change any of the existing emission limit values in the IE licence. The proposed development will require an update to the existing IE licence from the EPA, namely, to add the proposed auxiliary boiler exhaust stack as an emission point. Ultimately the EPA is the competent authority in relation to the IE licence, emissions and environmental management.

ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to include the proposed development under the IE licence. Public notification was issued in the Irish Times on the 08 January 2024.

1.6.2 COMAH Regulations

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (S.I. No. 209 of 2015) (“the COMAH Regulations”), implement the Seveso III Directive (2012/18/EU). The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The COMAH Regulations apply to any establishment where dangerous substances are present in quantities that exceed specified thresholds. The dangerous substances and threshold quantities are specified in Schedule 1 of the Regulations. Depending on the quantity of substances present at an establishment, it may either be a lower tier establishment or an upper tier establishment. Moneypoint Generating Station is listed as an ‘Upper Tier establishment” and is subject to regular routine inspection by the Health and Safety Authority (which is the Central Competent Authority for the Regulations) typically on an annual basis, the most recent inspection was undertaken on 26 September 2023[2].

The proposed development has been subject to a Land Use Planning Assessment in accordance with the Health and Safety Authority (HSA) Guidance. A copy of the COMAH assessment is provided in Appendix D of this EIAR. The HSA land use planning department have been informed of the proposed planning application.

[2] Public Information on an upper-tier establishment as required by Regulation 25 (HSA, 2023) (accessed 18 December 2023)

1.6.3 Commission for Regulation of Utilities Authorisations and Licences

The Electricity Regulation Act, 1999 provided for the establishment of the Commission for Energy Regulation (CER), renamed to the Commission for Regulation of Utilities (CRU), and the necessary powers to licence and regulate the supply, distribution, transmission and supply of electricity in Ireland.

In order to construct the proposed development, it is necessary to have an Authorisation to Construct from the CRU. Similarly, it is necessary to have a Licence to Generate in order to generate electricity. It is the CRU's role to grant, monitor the performance of, modify, revoke and enforce these Authorisations and Licences.

Should the application for planning consent be successful, ESB will apply to the CRU for the necessary authorisation and licence.

1.6.4 Screening for Environmental Impact Assessment

Article 2(1) of the EIA Directive sets out the overarching requirement for projects to be assessed with regard to their effects on the environment by virtue, inter alia, of their nature, size or location. In determining the requirement for EIA, the EIA Directive differentiates between the projects that mandatorily require EIA and those for which an EIA may be required. These projects are listed in Annex I and Annex II of the EIA Directive respectively.

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296/2018) amended the Planning and Development Act 2000 and the Planning and Development Regulations 2001 in order to transpose into Irish Law the provisions of Directive 2014/52/EU.

Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations 2001, as amended, transposes Annex I and Annex II to the amended Directive 2014/52/EU, and lists type of projects which may result in significant effects to the environment;

- Part 1 projects are projects which are considered as having significant effects on the environment and require a mandatory EIA; and
- Part 2 projects are those not included in Part 1 but may require EIA where the proposed development is of a class specified in Part 2 and equals or exceeds the relevant thresholds; or, where the proposed development would be of a class specified in Part 2, but does not equal or exceed prescribed threshold in Part 2 yet it is concluded, determined or decided, that the proposed development is likely to have a significant effect on the environment.

The screening process for Environmental Impact Assessment was conducted to determine if the requirement for mandatory EIA arises and the review concluded that the requirement for mandatory EIA has been met for a number of elements of the development, as discussed in Section 5.3.

The EIA screening is carried out with regard to the European Commission's Guidance on Screening (2017)[3].

[3] Environmental Impact Assessment of Projects – Guidance on Screening (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017)

1.6.5 Appropriate Assessment

Mott MacDonald has prepared a Stage 1 screening for Appropriate Assessment (AA) which considered the potential for the proposed works to have significant effects on European Site(s), either alone or in combination, with other plans or projects. The assessment concluded that there is potential for significant effects on European sites in the absence of mitigation from the proposed works and a Natura Impact Statement (NIS) has therefore been prepared to accompany the application.

1.7 Consultation and Engagement

Consultation and engagement was undertaken for the proposed development with both statutory and non-statutory stakeholders. This included a pre-application consultation with An Bord Pleanála. Stakeholder consultation was carried out proportionate to the scale and significance of likely impacts associated with the needs of the proposed development. In this instance where a formal response was provided by a stakeholder, these were discussed with the project team.

A summary of pre-application meeting with An Bord Pleanála is provided in Section 1.7.2 and a summary of pre-application meeting with Clare County Council is provided in Section 1.7.3.

ESB have also held consultation meetings with the Environmental Protection Agency (EPA) and the Health and Safety Authority (HSA), details of which are provided in Section 1.7.4 and Section 1.7.5 respectively.

ESB hold regular engagement meetings with landowners neighbouring the Moneypoint Generating Station which have resulted in positive responses from the community. During one such engagement in September 2023, ESB informed the landowners of the proposed development. A summary of this engagement is provided in Section 1.7.6.

In addition to the above, there has been media coverage on the proposed development across local and national news outlets. Such coverage has highlighted that the conversion from coal to HFO, is an important step in decarbonising the energy sector and that the retention of Moneypoint as a power generator of last resort, will be vital to ensuring national security of supply in the period up to 2030. Media coverage has also reiterated ESB's intention to operate Moneypoint as an out of market generator, which will operate, at the instruction of EirGrid, during times of shortage of generation.

1.7.1 Statutory and Non-Statutory Bodies

Table 1.1 lists the bodies notified via email of the EIAR on the proposed development. A copy of the letter issued to these bodies is provided in Appendix B.

Table 1.1: Stakeholder Consultees

No.	Stakeholder
1	An Taisce
2	Bird Watch Ireland
3	Clare County Council
4	Commission for Regulation of Utilities
5	Department of Environment, Climate and Communications
6	Department of Rural and Community Development
7	Development Applications Unit (DAU), Department of Housing, Local Government and Heritage
8	EirGrid

No.	Stakeholder
9	Environmental Protection Agency
10	Fáilte Ireland
11	Gas Networks Ireland
12	Health and Safety Authority
13	Health Service Executive - West
14	Heritage Council
15	Inland Fisheries Ireland, Limerick
16	Irish Aviation Authority
17	Irish Whale & Dolphin Group
18	Kerry County Council
19	Southern Regional Assembly
20	The Arts Council
21	Transport Infrastructure Ireland
22	Uisce Éireann

Table 1.2 below summarises the responses received from the various bodies and discussions held with these bodies, and identifies where such points have been addressed in the EIAR.

Table 1.2: Summary of Stakeholder Engagement

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
Clare County Council (CCC)	E-mail/letter correspondence 8 September 2023, 17 October 2023; Online meeting with ESB on 20 September 2023 (see Section 1.7.3 for details)	CCC issued a letter in response to the stakeholder letter and following the meeting with ESB (see Section 1.7.3 for details) on 20 September 2023. The response noted the key policies, objectives, site specific information, and planning considerations to be addressed in the SID application. The response also noted natural heritage, archaeological and architectural heritage and social and visual amenities in vicinity of Moneypoint Generating Station to be included in the EIAR for proposed development.	The planning policies and objectives relevant to the proposed development are discussed in the Planning Report (Ref: 229101323_401 | 5) that accompanies this application. The natural heritage features are assessed in Chapter 10 Biodiversity and the AA/NIS submitted as part of this application. The archaeological and architectural heritage is assessed in Chapter 13 Archaeology, Architectural and Cultural Heritage. The social amenities are assessed in Chapter 6 Population and Human Health. The visual amenity and landscape features are assessed in Chapter 14 The Landscape.	Chapter 10 Biodiversity and the Project NIS Chapter 13 Archaeology, Architectural and Cultural Heritage Chapter 6 Population and Human Health Chapter 14 The Landscape
Department of Rural and Community Development	E-mail/letter correspondence 8 September 2023	The Department confirmed that the contents of the stakeholder engagement letter have been noted.	No response required.	N/A
Development Applications Unit (DAU), Department of Housing, Local Government and Heritage	E-mail/letter correspondence 8 September 2023, 6 October 2023	DAU provided a response on behalf of the NPWS, their comments are summarised below. – Available guidance should be followed in preparing the NIS, noting any relevant changes brought about by case law of the Court of Justice of the European Union. The response outlined plans and projects of potential relevance to in combination effects. – The risk of impacts arising from any increase in traffic of delivery oil tankers in the outer estuary need to be fully assessed in the EIAR and NIS. These impacts include cumulative increase in underwater noise, increase in risk of oil spill in the outer estuary, increase in risk of introduction of invasive marine organisms. Potential impacts from accidental oil discharge during loading or transport, catastrophic explosion and oil release should be considered in detail. During winter, while the flow tide has its strongest current in the	The scope of the assessment was carried out having regard to the comments provided by DAU. The project NIS which accompanies this application has been prepared with regards to updated guidance and relevant case law. HFO is currently delivered to site by ship to the HFO unloading arm on the jetty and pumped to the existing HFO tanks via a pipeline. This is the existing arrangement and is not proposed to change. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. However, HFO ships are generally much smaller with an average payload of ca. 27,000 tonnes, or just over one full tank. This compares with an average ship payload of ca.180,000 tonnes for a coal ship. The potential risk from an oil spillage and delivery details are included in the assessment. The ZoIs identified for various ecological receptors has been set out within the chapter. The ZoIs for coastal and marine habitats up to 120km from site was	Chapter 10 Biodiversity and the Project NIS and CEMP Separate noise and air quality assessments have been undertaken refer to Chapter 7 and 9 of the EIAR

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
		middle of the estuary off Beal Point, the ebb flow tide becomes stronger nearer to Beal Point, and this, combined with a north-westerly wind, could carry surface oil which entered the narrow part of the estuary back onto the coast, from a spill originating in the Beal Bank area. Both offshore and onshore SPAs in the region should be included in the NIS and risk assessment for oil spills as oil spills can affect seabirds originating from distant protected sites. The EIAR and NIS should separately assess coastal habitats listed for conservation in the Lower River Shannon SAC and how they might be protected in the event of an oil spill in the outer estuary. The assessment should also address the question of the availability of sufficient oil booms to be rapidly deployed on the Clare and Kerry coasts in the case of an oil spill. The EIAR and NIS should also focus on measures to reduce the risk of an oil spill occurring, in relation to international best practice for tankers entering protected areas. Any impacts (such as contaminated soil) associated with the final decommissioning of site (which is to be the subject of a separate planning application) may need to be assessed within this application if being rebuilt upon. A description of shoreline habitats near the jetty will be required and details of any new infrastructure required for jetty should be described in full. The construction noise disturbance should be detailed in the EIAR, and air dispersal modelling should be considered as well as part of the EIA. – A record of a lesser horseshoe bat roost is noted on site.	considered. A Construction Environmental Management Plan (CEMP) has been prepared and accompanies this planning application. All reasonable measures will be taken to avoid / mitigate likely significant impacts pollution control measures will be set out within Section 10.8 of Chapter 10 Biodiversity within this EIAR and the CEMP. For example, ships carrying HFO to Moneypoint will adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM). Moneypoint is a member of the Shannon Estuary Anti-Pollution Team (SEA-PT). The group consists of the Port Company, Local Authorities, Offshore Industry and Oil Importers and was initiated to form a unified coordinated response to pollution incidents on the Shannon Estuary. Emergency response exercises are conducted periodically with SEA-PT and Moneypoint also periodically do their own emergency response exercises. Measures will be implemented during the transit of the HFO vessels to Moneypoint including that the oil tankers shipping the HFO will have regard to the International Safety Guide for Oil Tankers and Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS) Further details are outlined in Chapter 10 Biodiversity and the project NIS. Site walkovers were conducted for invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). No Third Schedule Invasive Species were identified within the ZoI proposed development. The risk of introduction of invasive marine species and coastal habitats is included in the assessment in Chapter 10 of the EIAR. Air dispersal modelling has been carried for the proposed development please refer to Chapter 7 Air of this EIAR. Potential impacts including construction noise disturbance on the European Designation sites are further considered within Chapter 10 Biodiversity and the project NIS which accompanies this application. The proposed development comprises works within the existing Moneypoint Generating Station complex however it is	

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
			noted that no works are proposed below the high-water mark or on the existing jetty to the complex. Shoreline habitats are described in the assessment and noise disturbance is assessed. Separate noise and air quality assessments have been undertaken refer to Chapter 7 and 9 of the EIAR. A discussion on the lesser horseshoe bat is provided in Section 10.4 in Chapter 10 of the EIAR.	
Fáilte Ireland	E-mail/letter correspondence 8 September 2023, 18 September 2023, 3 October 2023	No comments at this stage of the project.	No response required.	N/A
Gas Networks Ireland (GNI)	E-mail/letter correspondence 8 September 2023	GNI confirmed that they have no recorded gas network within the area of interest. Before starting work any work in the vicinity of the gas network, the GNI safety booklet, *Safety advice for working in the vicinity of natural gas pipelines* (2021) should be referred to. All work in the vicinity of a gas transmission pipeline must be carried out in compliance with Health and Safety Authority, *Code of Practice for Avoiding Danger from Underground Services*. Quarrying or blasting must not be carried out within 400 m of the gas network until GNI has been consulted. A part of the Aurora Telecom Network may be present on the network map.	There are no GNI assets within the application area.	N/A
Health Service Executive (HSE) - West	E-mail/letter correspondence 8 September 2023, 18 September 2023, 3 October 2023	HSE noted that this matter does not fall under the remit of the Regional Health Forum West, which deals with the range and operation of health and personal social services provided within its functional area as appropriate.	No response required.	N/A
Inland Fisheries Ireland (IFI), Limerick	E-mail/letter correspondence 8 September	IFI comments are summarised below. Particular attention should be paid to the hydrology of any site area where excavations, including excavations for	The scope of the assessment was carried out having regard to the comments provided by IFI. No instream/ river/ estuary works will take place, so the main concerns are indirect effects	Chapter 10 Biodiversity and Chapter 11

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
	2023, 27 September 2023	road construction are being undertaken. It is important that natural flow paths are not interrupted or diverted in such a manner as to give rise to erosion or instability of soils caused by an alteration in water movement either above or below ground. The EIAR should address any changes to water abstraction rates and/or to the cooling water regime on site. This should also address any consequent changes on the thermal environment of the River Shannon and on fish entrainment. The design and impact of the proposed ash landfill to the north of the N67 on the local ground and surface water resources shall be described in full. Attention should be paid to drainage during both the construction phase and the operational phase, including waters being pumped from foundations or other excavations. It is particularly important during the construction phase that sufficient retention time is available in any settlement pond to ensure no deleterious matter is discharged to waters. Recommendation that settlement ponds are maintained, where appropriate, during the operational phase to allow for the adequate settlement of suspended solids and sediments and prevent any deleterious matter from discharging. In constructing and designing silt traps particular attention should be paid to rainfall levels and intensity. The silt traps should be designed to minimise the movement of silt during intense precipitation events where the trap may become hydraulically overloaded. It is essential that they are located with good access to facilitate monitoring sampling and maintenance. Any instream works or other works which may impact directly on a watercourse should only be carried out during the open season which is from 1st July to 30th of September in each year (so as to avoid impacting on the aquatic habitat during the spawning season). It would be important that appropriate scheduling of works is allowed for.	(pollution). No changes are proposed to water abstraction rates or cooling water regime. All details of the proposed development are provided and considered. A CEMP has been prepared and accompanies this planning application. All reasonable measures will be taken to avoid / mitigate likely significant impacts pollution control measures will be set out within the mitigation section of Chapter 10 Biodiversity and Chapter 11 Surface water Resources and Flooding within this EIAR and the project CEMP. The Moneypoint Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Register Number: P0605-04), regulated by the EPA. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to regularise the proposed development under the IE licence. Public notification was issued in the Irish Times on the 08 January 2024.	Surface water Resources and Flooding within this EIAR and the CEMP

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
		The EIAR should indicate proposals to monitor the impact on watercourses within the site. In the event that environmental damage to the aquatic habitat and associated riparian zone is caused, the EIAR should indicate the steps that may be taken to rectify any damage to the aquatic habitat including liaison with the appropriate authorities. The discharge of polluting or deleterious matter to any watercourse except under and in accordance with a licence may be an offense under the Fisheries Acts and/or under the Water Pollution Acts.		
Irish Aviation Authority (IAA) (directed us to Shannon Airport Authority (SAA) and AirNav Ireland)	E-mail/letter correspondence 8 September 2023, 12 September 2023, 2 October 2023	SAA, AirNav Ireland comments are summarised below. SAA has a “safeguarding” remit for their aerodrome and AirNav Ireland have a safeguarding role for the Instrument Flight Procedures at Shannon Airport. The only real area of concern for SAA relates to the demolition phases within the project and the possible deployment of tower or mobile cranes on site to assist in the demolition of infrastructure. SAA, AirNAV Ireland and the IAA have responsibilities in the safeguarding area with specific responsibility for areas such as Obstacle Limitational Surfaces (OLS) management, NAVAIDS/Radar oversight and protection of Instrument Flight procedures (IFP’s). Crane Operations have the possibility to affect these areas. Although the geographical distance between the airport and Moneypoint itself probably significantly reduces the risk. For AirNav Ireland the initial review indicates no issue even if cranage is deployed. Regardless, they wish to remain part of the consultation process as the project moves to planning application submission to ensure that relevant aviation stakeholders are aware of the development.	The red line boundary was further refined to have regard to the deployment of cranes during construction. Cranes will not exceed the existing main stack height.	N/A
Irish Whale & Dolphin Group (IWDG)	E-mail/letter correspondence 8 September 2023, 11	IWDG requested a call with MM as they consider the project as important and potentially impactful. A follow up call was arranged with IWDG. The project team assured IWDG that there are no works proposed in the estuary.	No response required.	N/A

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
	September 2023, 27 October 2023	IWDG issued a response following this call stating that the proposed development does not raise any immediate concerns with the IWDG, considering that any additional works necessary will be undertaken within the boundaries of the site at Moneypoint and no works are proposed to take place in-water or on the shore. IWDG also recognised that the transition to renewable electricity generation is a matter of great urgency as acknowledged in the Government's Climate Action Plan 2023; however, a pragmatic approach must be taken to maintain energy supply and security.		
Shannon Foynes Port Authority	Online meeting with ESB on 21 September 2023	ESB provided an update on their plans for the Moneypoint Generating Station including the conversion from coal to HFO and the potential need to increase tanker ship sizes given the increased storage volumes, and the increased number of marine tanks replacing coal ships proposed. ESB also informed the dates for transition from coal to HFO and ESB's long term plan for the site including the Green Atlantic @ Moneypoint, and the proposed export of ash from site.	No response required.	N/A
Transport Infrastructure Ireland (TII)	E-mail/letter correspondence 8 September 2023, 29 September 2023	TII comments are summarised below. The proposed site adjoins and traverses the N67 national road at a location on the network that is subject to an 80kph speed limit. In such circumstances, it is critical that the developer/applicant be aware that official policy concerning access to national roads seeks to avoid the creation of additional access points from new development or the generation of increased traffic from existing accesses (i.e., non-public road access) to national roads, to which speed limits greater than 50kph apply. There are critical policy and road safety considerations that would need to be resolved to demonstrate that access proposals are developed that adhere to the provisions of Government policies. Consultations should be had with the relevant Local Authority/National Roads Design Office, with regard to locations of existing and future national road schemes. There are concerns as to potential significant impacts the	The transport and traffic assessment presented in Chapter 15 of this EIAR is prepared having regard to TII's best practice guidance and in consideration of existing and future national road schemes. This chapter assesses the potential likely significant construction and operational impacts on the road network. The proposed development will not create any additional access points to the N67. The proposed development is not subject to Traffic and Transport Assessment. Consistent with advice set out in the TII Traffic and Transport Guidelines (May 2014), a full Traffic and Transport Assessment (TTA) is not warranted in respect of the operational phase given that operational traffic associated with the proposed development will be similar to that of the existing development. Therefore, potential Roads and Traffic related environmental effects during the operational phase have been scoped out. The proposed development does not include any new road construction or any	Chapter 15 Traffic and Transport, CEMP and accompanying TMP

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
		development would have on the national roads network (and junctions with national roads) in the proximity of the proposed development, including the potential haul route. The best practice guidance should be followed during the development of the project. Planning decisions and existing and future national road schemes in the vicinity of the project listed by TII should be considered during the EIA process. A Traffic and Transport Assessment, where appropriate, should be carried out. TII publications should be consulted to identify if a Road Safety Audit is required. EIAR should identify methods proposed for any works in proximity to existing and future national road network. Haul routes should be clearly identified and requirement for permits and licences in relation to the haul routes should be identified. The visual impacts from existing national roads should be assessed. Any damage caused to the pavement on the existing national road arising from any temporary works shall be rectified in accordance with TII Standards.	amendments/changes to the existing public road network therefore no Road Safety Audit would be required. A CEMP and Traffic Management Plan (TMP) has been prepared and accompanies this planning application including all reasonable measures to be taken to avoid / mitigate likely significant impacts, including identification of haul routes. The TMP details proposed traffic management measures and associated interventions to be implemented during the construction phase of the proposed development to minimise disruption and enhance road safety.	
Uisce Éireann (UE)	E-mail/letter correspondence 8 September 2023, 29 September 2023	UE comments are summarised below. Any potential impacts on drinking water source(s), nearby reservoirs as public water supply, capacity of water services, surface water discharges, UE assets, contributing catchment of water sources, water quality should be discussed in the EIA and mitigations should be included in the Environmental Management Plan and incident response. Hydrological / hydrogeological pathways between the development site and receiving waters should be identified. A waste sampling strategy should be included where the development proposed backfilling of materials. If the development would discharge trade effluent, any upstream treatment or attenuation of discharges is required prior to discharging to an UE collection network. The location of public water services assets, possible connection points to the public network and any drinking water abstraction should be determined. Mitigation measures should ensure zero risk to any UE drinking water sources (surface and ground	The impacts to UE assets and drinking water sources are assessed in Chapter 11 Surface water Resources and Flooding of this EIAR. There are no proposed surface water discharges to combined sewer networks. The pathway to discharge surface water outside the proposed bunded area will follow that currently taken by water from the existing bund with no additional modifications necessary. Roof drainage from proposed boiler house, batching plant and FGD ash injection containment building will connect into the existing drainage network. There are no licenced surface water abstraction points within the vicinity of the proposed development site, and potable water is not sourced within the vicinity of the site. A CEMP has been prepared and accompanies this planning application. All reasonable measures will be taken to avoid / mitigate likely significant impacts pollution control measures will be set out within the mitigation section of Chapter 11 Surface water Resources and Flooding within this EIAR and the CEMP. The Moneypoint Generating Station complex	Chapter 11 Surface water Resources and Flooding

Stakeholder Name	Form of Engagement	Summary of Responses	Project Team Response	Section References
		water). Uisce Éireann will not accept new surface water discharges to combined sewer networks.	operates, and will continue to operate, under the existing Industrial Emissions licence (Register Number: P0605-04), regulated by the EPA. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to regularise the proposed development under the IE licence. Public notification was issued in the Irish Times on the 08 January 2024.	

1.7.2 An Bord Pleanála

ESB entered in consultation with An Bord Pleanála within the provisions of Section 37A of the Planning and Development Act 2000 (as amended). A screening letter was sent to the Board on the 3 April 2023 seeking confirmation as to whether a proposed development constitutes Strategic Infrastructure Development (SID) pursuant to Schedule 7 of the Planning and Development Act, 2000 (as amended). The letter provided a description of the proposed development and an overview of the need for the development. The letter considered the relevant thresholds within the 7th Schedule and Section 37A.

A pre-application meeting was held with ABP on the 11 August 2023. ABP queried whether the proposed development would extend below the high-water mark. An outline of the proposed development and the nature of the works was provided to the Board. ABP noted that the project documentation should set out the context need regarding security of electricity supply issues and provide robust justification regarding the choice of fuel (HFO). These are addressed in Chapter 2 and Chapter 3 of this EIAR and separately set out in the accompanying Planning Report. ESB stated that the proposed development will act as an out of market generator of last resort. ESB confirmed that no development will occur within the nearshore and no changes are proposed at the existing loading jetty area. ESB noted that the Green Atlantic @ Moneypoint project would succeed the proposed development and details of the project are not known at the time of writing this EIAR. There are no project interdependencies between the subject proposed development and Green Atlantic @ Moneypoint. Green Atlantic @ Moneypoint will be subject to a separate planning consent application. It was noted that the estimated timelines will not overlap with the proposed development.

ABP subsequently confirmed, by letter dated 17 November 2023, that the proposed development does fall within the scope of Schedule 7 of Section 37A of the Planning and Development Act 2000 (as amended). The proposed development would be Strategic Infrastructure Development (SID) and that any application for approval for the proposed development must therefore be made directly to An Bord Pleanála. A copy of this determination is included with the planning application documentation (Appendix B).

1.7.3 Clare County Council

An in-person pre-planning meeting was held with Clare County Council (CCC) on the 20 September 2023, at which the ESB provided a presentation and outline of the proposed development and likely SID application.

CCC queried the likelihood of any potential COMAH implications, to which ESB responded by stating that there is no significant change, and that this would be fully addressed in a Land Use Planning (COMAH) Report which would accompany the planning application documentation (see Appendix D). CCC also asked about any likely employment implications of the proposal, to which ESB responded that there would be an anticipated increase in employment during the construction phase and would maintain employment at Moneypoint over the duration of the TCM. Details on anticipated employment during the construction phase are set out in Chapter 4 and Chapter 6 of this EIAR. CCC also indicated that ESB should ensure that all relevant policy provisions are comprehensively addressed, including in respect of the Shannon Integrated Framework Plan, i.e. marine related policy, energy and renewables. CCC also advised that local elected members should be provided with an update and briefing on the proposed development.

A letter from ESB was circulated by the Council to the elected Members in September 2023. This outlined the future energy generation proposals for Moneypoint, the proposed transition from coal to oil, and the subsequent decommissioning of the generation station.

1.7.4 Environmental Protection Agency (EPA)

ESB held online meetings with the EPA on three occasions (17 April 2023, 11 July 2023 and 13 November 2023) to discuss the particulars of the proposed development and the Large Combustion Plant Best Available Techniques (BAT) conclusions and the Moneypoint Security of Supply Project. A submission was issued to the EPA on 15 December 2023 which included the information required to update the IEL.

1.7.5 Health and Safety Authority

An online meeting was held with Health and Safety Authority (HSA) on the 28 November 2022, at which the ESB provided a presentation and outline of the proposed development works. In August 2023 ESB approached the HSA, via email, to discuss the appropriate mechanism by which to provide COMAH information to the HSA in relation to this planning application.

1.7.6 Local Engagement

As part of the regular update meeting held at the Moneypoint site on 12 September 2023 with the locals, an outline of the proposals and the scope of the EIAR was presented. The event was advertised in a local circular in advance of the meeting. A copy of this notice is included in Appendix B. Issues and concerns raised included the following:

- There were some concerns with regard to the visual impact of the ASA and in particular that visualisations should be provided to help locals understand the impact. ESB confirmed that the proposed finished final ASA level is significantly lower than the consented level and that photomontages would be included with the EIAR with viewpoints that locals are more likely to experience. A copy of the photomontages is provided in Appendix K and the potential for any significant visual effects resulting from the proposed development are discussed in Chapter 14 of this EIAR.
- Some concern with regard to the uncertainty with what will happen at Moneypoint after 2029 was raised.
- A concern was raised regarding the reclamation of ash and the potential for dust. ESB confirmed that tests have shown that the moisture level is quite high for the reclaimed material, preventing ash dust dispersion and that dust control measures would continue to be in place at the ASA and potential for any significant effects resulting from construction dust are discussed in Chapter 7 of this EIAR.
- ESB confirmed there was no plan to make any changes to the public road.
- A member of local Killimer Historical Society provided additional information on the history of the area as a follow up to the meeting.
- ESB confirmed that a third party (Mott MacDonald) were preparing the EIAR and that ESB are providing information to form the bases of the assessments, but that ultimately ABP would be the competent authority to undertake the statutory assessment. It was also confirmed that there would be a submissions period where any additional comments could be submitted to ABP for their consideration.
- ESB committed to informing locals of the upcoming application closer to the time and that this would include providing a link to the project website.

1.8 Structure of this EIAR

This EIAR has been prepared in accordance with the EIA Directive and having regard to the *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022)[4].

The EIAR is presented in three volumes, as below. This report presents Volume 2 of the EIAR.

Volume 1 presents a Non-Technical Summary (NTS) of Volume 2 of the EIAR, including a summary of each technical section of the EIAR.

Volume 2 includes the Main Report, the structure of which is as set out in Table 1.3.

Table 1.3: Structure of this EIAR

Chapter No.	Chapter Title
1	Introduction
2	Need for the Proposed Development
3	Alternatives Considered
4	Description of the Proposed Development
5	EIAR Methodology
6	Population and Human Health
7	Air Quality
8	Climate
9	Noise and Vibration
10	Biodiversity
11	Surface Water Resources and Flooding
12	Land, Soils and Hydrogeology
13	Archaeology, Architectural and Cultural Heritage
14	The Landscape
15	Traffic and Transport
16	Material Assets and Waste Management
17	Major Accidents and/or Disasters
18	Interactions between Environmental Factors
19	Summary of Mitigation and Monitoring Measures
20	References

Volume 3 includes appendices providing supporting information to Volume 2 of the EIAR. A list of appendices included in Volume 3 is presented below.

Appendix A: Team Credentials

Appendix B: Stakeholder Letters and Consultation Records

Appendix C: Construction Environmental Management Plan (CEMP)

Appendix C.1: Resource and Waste Management Plan (RWMP)

Appendix C.2: Traffic Management Plan (TMP)

Appendix D: Technical Land Use Planning Report

[4] Hereafter the “EPA Guidelines 2022”.

2 Need for the Proposed Development

2.1 Introduction

This chapter sets out the need for the development and outlines the letters and supporting documentation regarding the proposed development.

2.2 Project Need

Ireland's national energy policy is focused on three pillars: (1) sustainability, (2) security of supply and (3) competitiveness. Ireland must reduce greenhouse gas emissions from the energy sector by at least 80% by 2050, compared to 1990 levels, while ensuring security of supply of competitive energy sources. The Commission for Regulation of Utilities (CRU) has a statutory responsibility, under the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the "Regulations"), to have regard to the security of supply of electricity and under Regulation 28(5), to take such measures as it considers necessary to protect security of supply. The proposed development, as described within Chapter 4 of this report, will contribute to the security of energy supply in Ireland for five years until 2029.

Under the Regulations, Regulation 28(10) provides that where the CRU has identified a likely and substantial risk to security of supply, the CRU, with Ministerial consent, may direct the transmission system operator, the public electricity supplier or any licensed undertakings, as appropriate, to undertake all or any such arrangements as the CRU considers necessary, including financial arrangements, relating to security of supply, in a manner approved by the CRU. The use of Regulation 28(10) is on the basis that it is "*not practicable in the time available otherwise to ensure security of supply*".

Issues around security and continuity of supply have recently arisen because of growing demand for electricity, unexpected generator outages, the intermittent nature of some renewables and delays in delivery of new gas fired and renewable generation capacity. EirGrid's identification of a potential capacity shortfall, is set out in its All-Island Generation Capacity Statement (GCS) 2021.

The CRU, working with System Operators, has therefore progressed several measures to support both medium-term and short-term electricity supply and demand balance. On 9 August 2021, the CRU published a number of letters which assist in providing context to the current considered risk and security of supply. On the 29 September 2021, the *CRU Information Paper Security of Electricity Supply – Programme of Actions* (CRU/21/115) was published by CRU on how to address this shortage.

These letters relate to directions to EirGrid, in respect of progressing some of the measures being undertaken, to protect and address the security of energy supply. The letters are summarised hereunder.

- 16 June 2021: Letter from CRU to Minister Ryan, Department of the Environment, Climate and Communications (DECC) – Ref. CRU21086
  - Outlined the security of supply and consequent 'emergency situation' as provided by EirGrid. EirGrid's 15 June 2021 letter and supporting report are also provided for context. The letter further outlined that the situation has led to a number of conclusions, including (inter alia) that "*This will require regulatory and government support relating to funding mechanisms; statutory licensing, consents and other requirements".* In closing, the CRU highlighted that should consent be issued, the CRU would work with DECC, EirGrid and relevant key stakeholder as appropriate, "*on the practical steps to secure the additional*

emergency generation, including the dis-application and/ or fast-tracking of environmental and other consents and requirements".

- 23 June 2021: Letter from Minister Ryan (DECC) to CRU – Ref. CRU21087
  - The Minister asked that the CRU consider "*why the current electricity market structure and the regulatory measures in place are not delivering the required level of new generation capacity necessary to ensure security of supply in Ireland and thus support the Government's emission reduction targets.*"
- 04 August 2021: Letter from EirGrid to ESB G&T
  - EirGrid highlighted recent engagement with CRU regarding measures identified to protect security of supply in the interim period as Ireland transitions to a decarbonised power system, whilst also dealing with increased demand in capacity. One such mitigation measure identified is the possible retention of the existing plant portfolio for the period to 2025, and potentially beyond. This includes units which have already submitted closure notices and those which have not yet done so. It includes units with specific environmental and other consenting restrictions, including Moneypoint (Units 1-3 inclusive).
  - EirGrid requested ESB to "*assess the feasibility and implications of non-closure of these plant", "consider any wider implications such a measure would involve, including, but not limited to; licencing, planning, maintenance and repair and make yourselves available for exploratory discussions into such practical implications*."
- 12 August 2021: Letter from ESB to EirGrid – Stating Moneypoint units' capability to operate beyond 2024
  - In response, ESB stated that the generating units in Moneypoint were technically capable of operation beyond 2024, though there may be restrictions imposed by BAT/BREF regulations when confirmed by EPA. Furthermore, due to their age, technology and complexity, any investment decisions were needed to be made well in advance of 2024, and a committed schedule of works agreed and delivered to ensure the units perform safely and to the required level of reliability.
- 15 September 2021: Letter from EirGrid to ESB G&T
  - Follow-up correspondence to kick off process "*to protect security of supply in the interim period as Ireland transitions to a decarbonised power system, whilst also dealing with increased demand in capacity, with specific reference to the possible retention of the existing plant portfolio for the period to 2025, and potentially beyond*."
- 29 September 2021: CRU Information Paper
  - On the 29 September 2021, the CRU published the *CRU Information Paper Security of Electricity Supply – Programme of Actions* (CRU/21/115). The Information Paper set out a programme of actions that the CRU is undertaking to ensure security of supply, in the context of the generation adequacy/system security requirements in Ireland, in the coming years, in cooperation with EirGrid, DECC, the energy industry, and other stakeholders.
  - One of the actions set out (Section 3.3 – Action 3) concerns the possibility of extending the operational life of a number of older units for a period until new capacity has been delivered to replace them through the Capacity Remuneration Mechanism (CRM). Discussions are already ongoing with these generators. In some cases, extended operation may require licence derogations, or other decisions relating to the Industrial Emissions Directive or planning permission. The intention will be to extend the operation of the older, more carbon intensive units only until replacement new capacity is procured, delivered and operational. In addition, given that these older plants tend to be higher emission fossil fuels based and more expensive to run, the intention will be that they will be available to support security of supply.

  - The Information Paper summarises EirGrid's assessment of a supply or generation deficit in the following winters 2022/23 to 2025/26 which is set out in the All-Island GCS 2021-2030. One key element of the Programme of Action in the Information Paper is:
    - The extended availability and operation of older generation capacity, on a temporary basis, that was otherwise expected to retire in this timeframe.
    - Security of supply risk – medium term - Extended operation of older generators (1,200MW)
- Subsequently, in November 2021, EirGrid published a 'Roadmap', *Shaping Our Energy Future*. Whilst this document seeks to outline key development from a networks, engagement, operations and market perspective that will be needed to support a secure transition to at least 70% renewables on the electricity grid by 2030, it also highlights the fact that in the short-term, there is an urgency to address the risks to security of supply. In this regard, it identifies there is a "*need to develop mitigating solutions that are outside of the current market construct*", and that "*where such solutions are approved, they will be proportionate and informed by clearly stated positions on the immediate short-term supply deficits and associated risks*".
- 30 November 2021: DECC Policy Statement
  - The Minister for the Environment, Climate and Communications, published a new *Policy Statement on Security of Electricity Supply* in November 2021. The Policy Statement indicates that the development of new conventional generation is a national priority and should be permitted and supported, in order to ensure security of electricity supply and facilitate the target of up to 80% renewable electricity generation by 2030. The Policy Statement supports the CRU and EirGrid, as they carry out their statutory roles to ensure security of electricity supply in Ireland. It provides clarity to investors and planning authorities that the Government fully supports the actions being taken by the CRU and EirGrid.
  - In this Policy Statement, the Government set out a number of updates to national policy in the context of the Programme for Government commitments relevant to the electricity sector, planning authorities and developers. Of note in the context of Action 3 of the CRU/21/115, the policy statement includes explicit Government approval that:

    "*It is appropriate that existing conventional electricity generation capacity, including existing, coal, heavy fuel oil and biomass fired generation, should be retained until the new conventional electricity generation capacity is developed in order to ensure security of electricity supply*".
- 20 December 2021: Letter from EirGrid to ESB setting out the head of terms for an agreement, technical requirements, and commercial arrangement.
  - The document captured the key areas discussed between both parties in the context of MP1, MP2 and MP3 units and reflected the current position of EirGrid and the ESB. The document sets out the Capacity Market Status in relation to the Moneypoint units, connection status, potential extension period, technical arrangements, environmental arrangements, commercial arrangements, revenue streams, key risks/barriers and timelines for agreement.
- 18 February 2022: Letter from ESB G&T to EirGrid
  - In relation to the CRU letter on Security of Electricity Supply – Programme of Actions CRU/21/115, dated 28 September 2021, where the CRU summarises EirGrid's assessment of a supply deficit in the following winters 2022/23 to 2025/26 as set out in the Generation Capacity Statement 2021. The CRU has outlined the key elements to address the capacity shortfall identified in the Generation Capacity Statement 2021. ESB aims to support the CRU and TSO to secure the necessary services that can support the system with this proposed development.

  - Section E.2.1.6 of the Capacity Market Code, through the Clean Energy Package (Article 22 Condition 4), means ESB's Moneypoint units are not eligible to enter into contracts for capacity from July 2025. Given the current absence of a route to a capacity contract beyond 01 October 2024, and the CEP arrangements from 01 July 2025, ESB believes there is significant risk to the commercial viability of the continuation of operations of the Moneypoint units.
  - As per 3.3.3 of the CRU21/115 Programme of Actions, and discussions on how ESB Moneypoint might be able to support. The retention of the Moneypoint units beyond 2025 without a CRM contract is not viable in the absence of a sufficient revenue recovery mechanism such as a Targeted Contract Mechanism.
- 12 October 2022: Letter from ESB to EirGrid – Stating ESB's preference to transition to HFO operation rather than coal.
  - The document sets out the reasons why HFO is preferable, including:
    - ESB Net Zero Strategy and stated position to cease coal firing by 2025,
    - Plans for the Green Atlantic @ Moneypoint and offshore wind development,
    - Unsuitability of coal for security of supply generation given deterioration in the coalyard, moisture pickup, complex fuel handling systems and reliability,
    - Coal availability on the spot market, and
    - The greater flexibility that HFO could provide for intermittent operation when compared with coal.
- 14 October 2022: Letter from European Commission to Department DECC Secretary confirming state aid position.

  The CRU September 2021 information note summarised EirGrid's assessment of an electricity supply deficit over the next four winters (2022/23 - 2025/26), and uncertainty over future auctions being able to meet projected demand, as a result of continuing challenging margins. In addition, it outlined key elements of the programme of actions being undertaken by the CRU, in line with its statutory duties, in cooperation with EirGrid, the Department of Environment, Climate and Communications, the energy industry and other stakeholders, to provide additional stability and resilience to the Irish energy system, through the retention of old generators and provision of temporary generators.

- 19 October 2022: Letter from Minster Ryan to CEO Paddy Hayes of ESB regarding temporary emergency measures to ensure security of electricity supply.
  - In reference to the CRU Programme of Work to ensure security of electricity supply, extensive "*engagement has taken place with the European Commission regarding the programme of temporary emergency measures being developed in conjunction with the CRU and EirGrid to address the urgent issues identified in relation to electricity security of supply*." The European Commission's Directorate-General Energy and Directorate-General Competition have outlined the Commission's position in relation to the programme of temporary emergency measures. "*The Commission notes the difficult security of supply situation Ireland faces and acknowledges that Ireland is taking a range of temporary measures to mitigate the risks arising from that situation, …the Commission has provided an assurance that proactively investigating those measures to assess their compliance with State aid and energy market rules is not a priority for the Commission*." A separate letter is expected from Directorate-General Environment on the environmental position of the proposed temporary emergency measures and in particular the retention of IED units "*I trust that, given these very positive outcomes from our dialogue with the European Commission and, in particular, the assurances given by the Commission in relation to the State aid position, all relevant stakeholders can support the expedited*

delivery of the required temporary generation and retention of existing units so that we can ensure adequate generation capacity for winter 2023/24."

- 14 August 2023: Finalisation of Targeted Contracting Mechanism (TCM) between EirGrid and ESB.

  On the basis of the above and to provide a security of supply service to the national electricity grid, ESB has therefore entered into a TCM contract with EirGrid which will run for the period October 2024 to 2029, for the proposed development to act as an out of market generator of last resort.

  "*Under the condition of the TCM with EirGrid, the plant will no longer be a base load merit plant in the capacity market, and it is envisaged that the Security of Supply generator will operate 3000 hours per annum per unit on HFO with distillate for start-up and shutdown (Up to a maximum of 5000hrs) under a security of supply contract. Typically, this will be during the winter months and at times of low renewable generation i.e., low wind, solar and hydro*."

- October 2023: Update to the Programme of Actions, published by the CRU.

  Subsequent to the abovementioned letters, the CRU published an update to the Programme of Actions in October 2023 following a review in early 2023. There was recognition that the scope and focus of the programme had shifted from planning, policy and commercial engagement towards delivery of generation and demand initiatives. Progress on the reconfigured workstreams (A) System Operations, (B) Demand Initiatives and (C) Delivery. Within the October 2023 update the following is stated in relation to Moneypoint under the delivery workstream –

  "The Retention of Existing Units (REU) workstream falls under the remit of Delivery. Its target is to extend the availability for operation of a number of older generation units, on a temporary basis, until new capacity has been delivered to replace them through the Capacity Remuneration Mechanism (CRM). EirGrid engaged with several operators concerning the feasibility of retaining in service a number of generation units in this context. The outcome of this action saw EirGrid cease engagement with a number of units where they continue to participate in the market and will remain in operation; a number proceeded to closure; and specific contractual arrangements were entered into with one party. In this regard, in August 2023, following Direction from the CRU, EirGrid entered into a Services Agreement with ESB for the continued availability of the three (3) units at Moneypoint after their planned closure date for the provision of Security of Supply services on an out of market and temporary basis".

- 17 October 2023: Security of Electricity Supply – Retention of Moneypoint Units (MP1, MP2 & MP3) published by the CRU.

  This information paper was prepared to provide transparency to the public and market participants in relation to the service agreement. The paper details how the agreement ensures the achievement of the objectives of CRU17346 (Regulatory Approach to Maintaining Local Security of Supply in Electricity) on managing generation exit in the context of security of supply. The paper also notes "*The possibility of holding a CRM auction for the 2024/2025 period that would include provision for units impacted by the requirements of Article 22(4) of Regulation (EU) 2019/943 to seek a capacity contract from 1 October 2024 to 30 June 2025 is currently being explored*". "*A modification to the Capacity Market Code published 27 September 2023 (CMC_07_23) allows extensions of the Interim Secondary Trading Arrangements (ISTA) to cover capacity that cannot operate for the whole Capacity Year but could still make an important contribution to security of supply*". The paper concludes that the agreement in regard to Moneypoint will reduce the risks to security of electricity supply while protecting customers and minimising market distortion.

The need for the proposed development is supported by European, national, regional, sectoral and local planning policies and objectives relating to energy development and energy security of supply. The Planning Report, submitted as part of this application, provides an overview of these and demonstrates how the proposed development will be consistent with the realisation of these commitments, policies and objectives.

3 Alternatives Considered

3.1 Introduction

EIA legislation requires that 'reasonable alternatives' for projects are considered. Within the European Commission's *Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)*, 'Alternatives' are defined as:

"Different ways of carrying out the Project in order to meet the agreed objective. Alternatives can take diverse forms and may range from minor adjustments to the Project, to a complete reimagining of the Project."

The guidance states that alternatives must be described and compared with an indication of the main reasons for the selection of the option chosen (Article 5(1)(d) and Annex IV point 2 of Directive 2011/92/EU as amended by Directive 2014/52/EU).

This chapter describes the do nothing scenario and alternatives that were considered for the proposed development under each of the headings below and the reasons for the selection of the preferred options.

- Fuel conversion
- New HFO tanks
- New auxiliary boilers
- Ash Storage Area (ASA) modifications
- Ash recovery for processing
- Partial coalyard dismantling

3.2 Fuel Conversion

3.2.1 Do Nothing

If the proposed conversion to HFO as the primary fuel and two new HFO storage tanks does not proceed, it is possible that extended power outages could occur in the absence of sufficient generators or fuel to cover the winter peaks in the period 2024 to 2029. This would have a significant adverse effect, in terms of energy requirements and supply on the island of Ireland.

To maintain security of supply it will be necessary to continue the operation of Moneypoint fuelled by coal. This is against the stated aim and strategy of the ESB, which is to cease all coal operation by the end of 2025 and enable the future development of offshore wind from the Moneypoint site. The continued operation on coal and continued use of consented FGD by-product storage will also have a knock-on effect on the future development of the Green Atlantic @ Moneypoint, which will provide a construction base for the offshore wind development post 2025.

Coal also does not offer the same flexibility as HFO due to longer start up, ramp up and shut down times.

The following sections provide discussion on alternative sites, technologies and fuels.

3.2.2 Alternative Sites

As discussed in Section 2.2, EirGrid and ESB are agreed on a Targeted Contracting Mechanism (TCM) for the provision of security of supply generation, of on average 3,000 hours per unit per year, for the period 2024 to 2029 with breakout clauses in 2027 and 2028 if sufficient new generation has entered the market. The proposed development will act as an out of market generator of last resort.

Moneypoint is a site of existing coal fired generation with existing technical capability to be fuelled using HFO. The proposed development is to change the primary fuel from coal to HFO, construct two new HFO storage tanks to double the strategic storage on site, reinstall auxiliary boilers to improve reliability and reduce start-up times, and modify the existing ASA to allow the excess FGD by-product to be used for landfill capping. Moneypoint was identified as meeting all the necessary criteria as it was otherwise pencilled for closure in 2025.

The majority of the existing infrastructure at Moneypoint Generating Station can be utilised, thereby negating the need to undertake extensive works as part of this proposed development and mitigating potential environmental impacts by avoidance.

The proposed development will not require the acquisition or development of any greenfield areas, mitigating by avoidance, potential environmental impacts.

The site has a long history of power generation and an established infrastructure network, thus establishing the principle and acceptability of energy generation and transmission infrastructure and use at the site. As the necessary transmission infrastructure is already in place and available to take the electricity generated, there will not be any requirement for works to upgrade the transmission infrastructure in the area as a result of the proposed development.

For the reasons stated above, alternative sites were not considered a reasonable alternative for proposed development.

3.2.3 Alternative Technologies and Fuels

EirGrid have sought generation technologies that could be delivered quickly. Given that the existing plant already has the capability of 100% HFO firing in addition to coal, it can be re-configured quickly and could generate significant amounts of electricity and comply with environmental emission controls and legislation. HFO conversion also offers the option of strategic ‘freeing up’ of the existing coalyard for future development associated with the Green Atlantic @ Moneypoint, where the existing coal handling equipment could be removed, and the area made available for future reconfiguration for offshore wind farm assembly.

HFO firing offers greater plant flexibility, reliability and improved start-up times. The proposed two additional HFO tanks, which will double the existing strategic capacity to 100,000 tonnes of HFO, will facilitate full load running for up to 20 days thus providing cover for an extended high pressure/no wind scenario. The extra HFO tanks would provide critical important strategic storage during a time of high gas market volatility both in terms of price and availability. This proposed 20 days of HFO fuel storage would, however, be considerably lower than the 13 weeks plus offered by coal storage in the existing coalyard.

Alternative fuels including gas conversion and biomass have been reviewed, however in both cases significant modifications will be required on the boilers, fuel handling and storage systems which are not commercial or technically feasible in the time available i.e. before the end of 2025.

- Gas conversion - A conversion of gas will entail running a new gas pipeline. The pipeline would likely need to be ca.25km in length from where the existing GNI pipeline crosses the River Shannon east of Labasheeda. It would likely also require construction of a new gas AGI (Above Ground Installation). A feasibility study has been carried out by Gas Networks

Ireland (GNI) and an estimated cost of a 21km High Pressure Gas Connection is approximately €150 million. In addition, it is estimated that in a 'best case scenario', this would take six years to construct. Discussions with the Boiler OEM (Original Boiler Manufacturer) regarding the suitability of these coal units for a gas conversion has indicated that significant modifications would be required including new burners, burner skids, burner management system, boiler tube wall modification, gas control station etc., and would require significant plant outages, cost in the region of €30 million per unit and take approximately five years to design and build. It would not be possible or practical to deliver this upgrade by the end of 2025. A significant amount of additional construction works would be required to undertake this which has the potential to have much greater and more complex environmental impacts than the subject proposed development.

In addition to the connection to the existing gas network, as stated above, another factor considered was that the existing units may require to derate (reduce boiler output) as the gas temperature from natural gas firing may be much higher than that of coal.

- Biomass co-firing studies were carried out on Moneypoint in 2008 and testing carried out in 2010, which showed that the existing mills were not suitable for biomass. Biomass conversion would therefore entail new biomass storage silos, new fuel handling system, new hammer mills, new burners and Burner Management System (BMS), as well as various engineering studies and boiler upgrades. A biomass conversion would require repurposing of the existing coalyard which would consequently require an extended outage of the entire plant and delay the future development proposal of the offshore Green Atlantic @ Moneypoint. In addition, it would not be possible or practical to undertake such conversion before the end of 2025. A significant amount of additional construction works would be required to implement this which have the potential to have much greater and more complex environmental impacts than the subject proposed development.

3.3 Fuel Storage / Supply Arrangement

There are two existing HFO tanks of 25,000 tonne capacity each, located in two separate earth bund areas, just north of the main unit buildings.

Up to 13 weeks of coal storage is possible in the existing coal yard.

The fuel storage/supply arrangement alternatives considered include:

- Remain operational on coal (do nothing alternative)
- Operating with the existing two tanks only
- Leasing HFO tanks
- New HFO tanks

Typically, there is low renewable power generation during winter months. At this time there is typically a high-pressure cyclone over the country which results in a period of very low temperature, low wind generation, reduced rainfall and very high energy requirements. It is common for this high-pressure cyclone to last a number of weeks; ideally, strategic storage needs to meet this extended energy shortfall period.

3.3.1 Do Nothing – Remain Operational on Coal

The do nothing alternative of remaining on coal is covered in Section 3.2.1 and whilst it is a viable option, long term storage of coal is problematic. Delivered low sulphur coal contains a significant volume of fines which when wet can become sticky due to a high moisture content when stored for an extended period of time, which becomes difficult to handle and mill. The coal sticks to the side of hoppers and chutes which causes blockages. The high moisture content also causes blockages in the mills which in turn results in delayed starts and unreliability. Coal

is also inclined to overheat if not stored correctly and requires considerable additional plant and resource to operate and maintain.

Additionally, there is less availability of coal in the spot market, and it requires long term contracts supported with usage guarantees which is not practical when operating as a security of supply electricity supplier. Additionally, it can take 4-6 months to procure a shipment of coal. This is not practical for operation as a supplier of last resort as the future operational hours cannot be accurately predicted.

3.3.2 Existing Two Tanks

There are two existing HFO tanks of 25,000 tonne capacity each, located in two separate earth bund areas, just north of the main unit buildings. Plant usage at full load is approximately 216tonnes/hr of HFO, and therefore a full tank will be consumed in approximately five days. An HFO marine delivery normally takes between 21 and 28 days to arrange, which is dependent on the availably of an HFO shipment in the open market and worldwide demand. A marine shipment is on average between 24,000 tonnes to 27,000 tonnes which effectively means that one tank will need to be emptied before a shipment can be delivered.

Given that ESB has no control on future running and the ‘just in time’ delivery of HFO shipments, to meet potential security of supply availability commitments will be extremely challenging without additional storage. It is also imperative that Moneypoint can operate continuously for an extended period during the winter in the event of an extended high pressure/no wind scenario.

3.3.3 Leasing HFO Tanks

A number of existing oil farms and fuel storage tanks are contracted to the National Oil Reserves Agency (NORA) for the long-term strategic storage of heating and transport fuel. A number of these fuel farms have had to undergo extensive works to bring them up to modern specifications and safety standards. HFO storage has different challenges to other fuels. Given its high viscosity, it requires fuel heaters, draw-off heaters, pipework tracing and special high viscosity pumps. Whilst under the right operating conditions the fuel is not flammable, it is still very challenging to manage and therefore tank leasing opportunities are rare.

Tarbert Generation Station on the south side of the Shannon Estuary in Co Kerry has decided not to enter into a similar TCM for security of supply. They have four HFO tanks located on Tarbert Island which may be available for leasing since the plant closed down. NORA have approached Tarbert regarding leasing these additional tanks for long term strategic storage. ESB have also had discussions with Tarbert Generating Station regarding the availability of these tanks, as well as the availability of small marine ships and barges to move HFO across the Shannon Estuary. Whilst this might be a viable option for longer term strategic storage by NORA, there is low availability of marine tankers for transhipping of HFO at short notice across the estuary. This would also require considerable investment to ensure the integrity of the Tarbert HFO tanks, modifications to allow marine tanker loading, and to ensure the correct planning and environmental consents are put in place. It would be more effective to contract a full HFO marine tanker from an EU port than get an empty tanker or barge to Moneypoint to transfer HFO from Tarbert. Discussion will continue but only with regards to medium/longer term strategic storage and not short term TCM commitments. However, this option is not considered a reasonable alternative at this stage.

3.3.4 New HFO Tanks

The option is to add two new tanks similar to the existing two HFO tanks on site and to double the total onsite HFO storage capacity to 100,000 tonnes. The additional HFO storage capacity will provide this security of supply.

The existing bund will be upgraded to include a concrete floor across the entire bund. New bund walls will be constructed from reinforced concrete. This option will facilitate the upgrade of the bund in line with containment requirement as set out in the Guidance Note to Industry on Fire Water Retention Facilities (EPA, 2019) and CIRIA Guidance C736.

In addition, existing HFO pumping and piping will be used for the purposes of filling the new and existing HFO tanks as well as supplying the boilers with fuel. Only new connections to the new tanks will be required. This option was deemed the preferred arrangement on the basis that it will provide security of supply plus it offers potential to improve the overall containment of the HFO bunds on site whilst ensuring minimal reconfiguration of HFO pumping and piping.

3.4 New Auxiliary Boilers

A number of alternatives were considered and presented to EirGrid for inclusion in the TCM and generation connection agreement targets called TOD's (Technical Offer Data) which govern items such as ramp rates, starting times, minimum on times, minimum off times, primary/secondary/tertiary energy reserves etc. Each option considered contributed to different plant start times, CO_2 emissions and flexibility, but came with different costs. Any proposed alternative would also be required to operate in line with existing consenting regimes. The site also operates in line with the conditions of the applicable Greenhouse Gas Emissions (GHG) Permit (Permit Register Number IE-GHG070-10381-6). It is not proposed to change any of the existing emission limit values in the IE licence.

The cold standby state can be defined as the main boilers drained and stored, minimum aux and ancillary system in services, the deaerators (D/A) filled and up to temperature >90^{o}C to allow fast filling of the boiler and one HFO tank up to temperature >45^{o}C to allow for immediate HFO pump forwarding to the generating units. If this cold standby state is not maintained, then the start times would increase by a minimum 24 hours to 10 days depending on HFO tank and ambient temperatures.

The alternatives considered for new auxiliary boilers include:

- No additional boilers (do nothing alternative)
- One 4MW boiler (Option A)
- One >16MW distillate boiler (Option B)
- One >16MW and one 4MW distillate boiler (Option C)
- Two >16MW distillate boilers (Option D)
- Two >16MW electric boilers (Option E)
- One >16MW distillate boiler and one >16MW electric boiler (Option F)

3.4.1 Do Nothing – No Additional Boilers

The do nothing option is to not install any additional auxiliary boilers. In this case the main boilers will be required to fire on distillate for a prolonged period until the boiler pressure has increased to 80 bar, at which time the unit becomes self-sufficient. In addition to slow start-ups the main boilers will need to be fired intermittently to heat the HFO and de-aerators so that the unit remains in a cold standby state. If the HFO tanks are allowed to cool to ambient temperatures it may take between 5 and 10 days, depending on ambient conditions to bring them back to operational ready state, which will jeopardise the ability of the plant to fulfil its security of supply contractual requirements, resulting in power cuts.

The use of these large generation boilers for heating and temperature retention of the HFO tanks and for start-up is extremely inefficient, resulting in at least four times the CO_2 emissions compared to the preferred option (Option F).

3.4.2 Option A – 4MW Boiler

This option only provided aux steam for heating and maintaining heat in the in-service HFO tank and unit D/A to maintain the plant in the cold standby state. It would not provide sufficient auxiliary steam for boiler start up, which would require the main boilers to fire on distillate for a prolonged period until the boiler pressure has increased to 80 bar, at which time the unit becomes self-sufficient. The start would take up to six hours longer and have significant more emissions due to inefficiencies of large boilers at low firing rates. This option ensures the plant remains in cold standby state but does not provide any assistance to start up and no redundancy to the existing auxiliary steam supply system.

3.4.3 Option B – One >16MW Distillate Boiler

This option provided for a single >16MW distillate fired aux boiler which would heat and maintain the in-service HFO tank and unit D/A to ensure cold standby state. It would also provide the maximum auxiliary steam flow of 7.2kg/s which is needed for normal start-up until the main boiler pressure reaches 80 bar at which stage the unitised auxiliary steam system can be brought into service and the unit becomes self-sufficient. This option provides for a reduced start up time, increased starting reliability and ensures the plant can remain in the cold standby state, however there is no redundancy and ability to start a second unit in parallel.

3.4.4 Option C – One >16MW and One 4MW Distillate Boiler

This option provided for a single >16MW distillate fired aux boiler and one 4MW distillate fired boiler which would heat and maintain the in-service HFO tank and unit D/A to ensure cold standby state. The larger boiler would then provide the maximum auxiliary steam flow of 7.2kg/s which is needed for normal start-up until the main boiler becomes self-sufficient. This option provides for a reduced start up time, increased starting reliability and ensures the plant can remain in the cold standby state, however there is limited redundancy provided by the smaller boiler during start-up, but will operate more efficiently at lower heat loads.

3.4.5 Option D – Two >16MW Distillate Boilers

This option provided for two >16MW distillate fired aux boilers which would heat and maintain the in-service HFO tank and unit D/A to ensure cold standby state and provide the maximum auxiliary steam flow of 7.2kg/s (per unit) needed for the normal start-up of two main boilers until they become self-sufficient. This option provides for a reduced start up time, increased starting reliability, ensures the plant can remain in the cold standby state, reduced start-up time of a second unit, provide significant redundancy and increased boiler reliability.

3.4.6 Option E – Two >16MW Electric Boilers

This option provided for two >16MW electric fired aux boilers which would heat and maintain the in-service HFO tank and unit D/A to ensure cold standby state and provide the maximum auxiliary steam flow of 7.2kg/s (per unit), needed for the normal start-up of two main boilers until they become self-sufficient. This option provides for a reduced start up time, increased starting reliability, ensures the plant can remain in the cold standby state, reduced start-up of a second unit, provide significant redundancy and increased boiler starting reliability. The electric option is more expensive but has a lower carbon footprint compared to the distillate option. One of the main disadvantages/risks, however, is the need to import up to 22.7MW of electricity at a time when there is low renewables and the grid is extremely tight. This option has the added advantage that low-cost renewables can be used for heating and temperature retention.

3.4.7 Option F – One >16MW Distillate Boiler and One >16MW Electric Boiler

This option provided for one >16MW distillate and one >16MW electric fired aux boiler, which would heat and maintain the in-service HFO tank and unit D/A to ensure cold standby state and provide the maximum auxiliary steam flow of 7.2kg/s (per unit), needed for the normal start-up of two main boilers until they become self-sufficient. This option provides for a reduced start up time, increased starting reliability, ensures the plant can remain in the cold standby state, reduced start-up of a second unit, provide significant redundancy and increased boiler reliability. This option is a compromise between Option D and Option E, in that it provides lower emissions than the distillate only option, provides the same level of starting reliability, is slightly more expensive, but mitigates against the risk of reduced electric import due to times of limited system capacity. This option has the added advantage of using low-cost renewables for heating and temperature retention. This is the preferred option for EirGrid.

Two 22.7MW boilers have been selected as the preferred option, as these are also readily available in the market and would be easier to sell for reuse at the end of the operation of Moneypoint Generating Station.

3.5 Ash Storage Area Modifications

There are three consented repository areas on the Moneypoint site as shown in Figure 3.1 and described as follows.

- FGD landfill Area A: FGD by-product is presently stored into area A located to the east of the coal yard; however capacity is expected to be reached in Q4 2024. Currently approximately 33% of the landfill area A is capped with the remainder proposed to be capped once it reaches capacity.
- FGD landfill Area B: Existing planning consent is in place for an additional FGD by-product landfill area B to the West of the main generating units. At present, this area is used for site laydown and contractor areas, and no FGD by-product has been stored in this area. Landfill area B has now been earmarked as part of the future Green Atlantic @ Moneypoint Project. It would be an inefficient use of land to deposit material in this area for the limited remaining timeframe of the station's operation.
- Ash Storage Area (ASA): Existing planning and EPA consent is in place for the storage of up to 4.8 million m^3 of ash in the ASA. The planning permission (P14/373) for the current capacity was granted in 2014. The footprint of the ASA covers approximately 25 hectares. A survey completed in June 2023 indicated that there was ca. 1.3 million m^3 of capacity remaining in the ASA.

Figure 3.1: Indicative Locations of Presently Permitted Landfills

Source: ESB © Google Maps

There are three challenges as a result of the units transitioning to HFO only and plans for the redevelopment of the Moneypoint site.

- FGD Landfill Area B has been identified as a potential laydown and pre-assembly area for offshore wind development. For this reason, the preference is to find an alternative location for future FGD by-product storage. Present estimate based on running hours is that the existing landfill area A will be full by Q4 2024.
- Currently approx. 30 tonnes per unit per week of fly ash is required for bed stability in the FGD. Due to the higher ash content of coal (7.7 to 9.1% versus, 0.15% maximum for HFO) enough ash is currently innately present in the flue gas for the FGD to function. As the units transition away from coal, this volume of ash will no longer be produced internally in the process so fly ash will have to feed into the system to ensure bed fluidity and that the stickiness associated with calcium sulphate is minimised. With three units operating on HFO for an average of 3,000 hours each per annum, this equates to a maximum of 120 tonnes per week, including a 30 tonne contingency allowing for variation in free lime ratios. Total ash requirement is therefore ca. 2,500 tonnes per annum recovered from the ASA at 25% to 45% moisture concentration. This ash will need to be recovered from the existing ASA.
- Capping and berm material used on site is a blend of 47.5% fly ash, 47.5% FGD by-product and 5% cement. FGD Landfill Area A is presently approximately 33% capped with the remainder to be capped once it reaches capacity. Only temporary capping is in place in the ASA. Following the cessation of coal production additional recovered fly ash will be required for the purpose of capping.

In general, Pulverised Fly Ash (PFA) and bottom ash have been kept separate to facilitate reuse.

Based on the projections indicated in Table 3.1 below, it has been estimated that the maximum volume of material proposed to be stored in the ASA between 2025 to 2029 will be

approximately 495,132 m^3. This is considerably less than the ca. 1.3 million m^3 available capacity in the ASA.

Table 3.1: Estimated Ash & FGD By-Product Production

	2025	2026	2027	2028	2029	Total 2025 to 2029
FGD Output (m^3)	75,912	41,400	41,400	41,400	41,400	241,512
Ash Output (m^3)	156,420	24,300	24,300	24,300	24,300	253,620
Total Storage Requirement (m^3)	232,332	65,700	65,700	65,700	65,700	495,132

The alternatives considered for ash storage area modifications include:

- Utilising the consented FGD By-product Landfill Area B from January 2025 (do nothing alternative)
- Storing the FGD by-product in a designated cell in the ASA
- Finding a market for FGD by-product
- Increased capping layer in the ASA by the required thickness

3.5.1 Do Nothing – Utilising the Condensed FGD By-product Landfill Area B

The do nothing option is to use the previously consented FGD by-product Area B and store the expected ca. 241,512m^3 of FGD by-product to be produced in the period 2025 to 2029 in this area. The downside of this proposal is that it will:

- Create a third repository area on site requiring a long-term management plan.
- Impinge on the existing contractor laydown area and will restrict future plans for the site.
- Use future ash stock in order to build a liner and berms for what is relatively a very small storage quantity.

Whilst this may be a viable option, from an environmental perspective it adds additional risks and long-term management requirements from operating a third repository area on the site as well as restricting future use of that area for the Green Atlantic @ Moneypoint project.

3.5.2 Designated Cell in ASA

Given that bottom ash and PFA is presently stored in separate designated cells within the ASA, an option would be to prepare a new cell for FGD by-product. The issue with this option is that all cells have now been started and contain significant amounts of either bottom ash or PFA. No viable option exists to extend the ASA as the area is surrounded by existing berms, road access and green field areas. Unlike FGD Landfill Area B, the ASA has no liner. The liner, berm and capping being used on site contains a blend of FGD By-product 47.5%, PFA 47.5% and 5% cement and is only being used since 2006 when the FGD abatement plant was installed.

A solution could therefore be to remove existing ash from a cell, install a liner and then use this cell for the future storage of FGD By-product. The requirement for a designated cell is to allow future ash sales of both bottom ash and PFA. Whilst this option is potentially viable, this option will require disturbance of the existing ASA and movement of stored ash. This would result in considerable additional HGV traffic on site and potential for additional related environmental impacts. Therefore, this option is not considered a reasonable alternative at this stage.

3.5.3 Alternative Markets for FGD By-product

Investigations are ongoing in order to identify a suitable market for FGD by-product. A dedicated team was setup within ESB to identify suitable market opportunities. However, at this time no suitable market exists, so this option is not viable in the short term.

3.5.4 Increased Capping Layer in the ASA

ASA capping and berm construction is with a mixture encompassing a blend of 47.5% fly ash, 47.5% FGD by-product and 5% cement. The capping material is mixed in the batching building upstream of the pipe conveyor, water is added to the mixture to bring the moisture ratio to ca. 15%. The mixture is then discharged into the tipper truck at Tower GT01 for transport to the ASA or FGD by-product landfill. The mixture is then levelled and compacted to form a capping layer to a depth of 0.6m. Note that capping to date has only taken place in the FGD By-product Area A.

By increasing the capping layer thickness from 0.6m to approximately 1.6m, the excess FGD by-product produced in the period post 2025 of ca. 241,512m^3 can be incorporated into the ASA. The result will be a significant reduction in the final height of the ASA compared with the height granted under planning permission 14/373, provided the same profile is maintained.

This will not affect the properties of the capping layers or the finish profile of the ASA. This will neither breach the existing consent which states a minimum thickness of the capping layer. This is considered the preferred option as it prevents the opening of a new repository site. It is worth noting that due to the reduction in future repository quantities the ASA will only have three phases instead of four and the finish height will be considerably lower.

3.6 Ash Recovery for FGD System

As the units switch to HFO only, insufficient fly ash (PFA) will be produced so ash will need to be reclaimed from the ASA and mixed in accordance with the ratios above for capping. To fulfil this requirement, there are two options as listed below.

- Recovery of ash from the onsite storage area, modification to the existing batching plant to allow wet ash to be tipped into a hopper and conveyed up to the existing mixture and then added to the existing FGD by-product and cement mix. The mixture is then returned to the ASA for capping purposes.
- A temporary mixing plant which allows conditioned FGD/By-product mix and reclaimed fly ash to be mixed at location in the ASA before spreading and compacting. This option may need notification to the EPA and reporting for GHG purposes. EPA will require evidence that the material is adequately mixed to the correct blend so controlled feed rates will be a must.

The ash concentration in HFO is 0.15% maximum, versus 7.7% to 9.1% for coal. At present PFA is used for capping/berm construction at the landfill sites, ASA and FGD By-product Area A. PFA is also allowed to be carried downstream from the precipitators to the FGD for the purpose of bed stability. The FGD absorber is a fluidised bed which contains a mixture of free hydrated lime, recirculated FGD by-product and carried over PFA. This bed allows the calcium in the lime to bond with the sulphur oxides (SO_x) in the flue gas to form calcium sulphite. An additional reaction occurs which creates some calcium sulphate or gypsum which is a stickier material, and for this reason it is required to feed additional ash to dry the material and prevent downstream blockages of filter bags, hoppers and FGD by-product transportation systems.

As discussed in Section 4.2.5 approximately 120 tonnes per week of fly ash will be required.

The ash recovery alternatives considered include:

- Increased free lime dosing
- Repurchasing dried ash from cement manufacturer
- Wet ash feed into the boiler
- PFA reclamation from the ASA, drying and feeding into existing PFA silo
- PFA reclamation from the ASA, feeding into each FGD absorber directly

Note: There is no do nothing option unless the existing situation remains or co-fire with coal as without a functioning FGD system the plant cannot meet IE licence ELVs and BAT for Sulphur Oxides (SO_x).

3.6.1 Increased Free Lime Dosing

An increase in lime dosing in order to increase the free lime concentration/ratio was reviewed as an alternative but on-site testing and experience concluded that this is not proven to be a viable solution and has caused hopper blockages and would require the increased use of raw materials.

3.6.2 Repurchase Dried Ash from Cement Manufacturer

Discussion with cement manufacturers concluded that they may increase PFA offtake in the short term but have no long-term plans for fly ash and some are repurposing existing PFA silos for alternative uses. Local limestone can be readily available, this is therefore not considered a viable option and would not achieve the circularity goal for the system.

3.6.3 Wet Ash Feed into the Boiler

A further option of wet ash injection into the furnace was reviewed. This was regarded as not feasible due to technical challenges, additional modelling and testing requirement. It was therefore considered high risk that the FGD process would not achieve required IE Licence ELVs and was therefore discounted.

3.6.4 PFA Reclamation from the ASA, Drying and Feed into Existing PFA Silo

A number of discussions have taken place with bulk materials handling specialists. Whilst the drying of ash using electric dryers is a technically viable option, the specialists would not propose an ash drying solution due to the technical challenges entailed in controlling moisture content and downstream transportation. This option provided a strategic storage option as the existing PFA silos could be used for medium term storage. However, given that the established companies were not willing to propose a technical design this option was considered not viable. Furthermore, this would have required additional equipment and used more energy in the drying process.

3.6.5 PFA Reclamation from the ASA, Feed into each FGD Absorber Directly

A feasibility and high-level design study proposed direct injection of reclaimed wet PFA into the FGD absorber upstream of the venturi where flue gas velocities are maximum. This flue gas will fluidise and dry the material in suspension and produce the same effect as feeding dry PFA into the process. This proposal is also simpler and more cost effective than the drying option (Section 3.6.2), however the downside of this option will be the lack of strategic storage of dried PFA on site and the need for more continuous reclaimed ash feeding whilst the unit is running, even during wetter winter periods.

This is the preferred solution as it offers the best technical and commercial solution to this issue as well as being less energy intensive.

3.7 Coalyard Dismantling

As indicated in the Section 1.1 of this EIAR, ESB intends on transforming the Moneypoint site and redeveloping it as a hub for the offshore renewable sector as part of the ESB's 'Towards Zero' Strategy. Part of this strategy aim is to cease all coal operation by the end of 2025. The expectation is that coal burning will cease in mid-2025 through careful coal stock management. A six month period has been allowed for any residual coal to be used and any coal recovery process to be embarked on in order to minimise coal residual volumes.

The coal handling equipment at Moneypoint encompasses 12no. towers which range from about one to five stories tall. Some of these are straight forward transfer towers or belt drive and tension facilities, others contain blending bunkers, crushers, sampling equipment etc. There are 37no. operational belts between coalyard and bunker top and these are typically enclosed in various conveyor bridge structures between towers. Most conveyor bridge enclosures have two conveyors i.e. 2A and 2B from Tower 1 to Tower 2, however some have three conveyors. The Stockyard conveyors 12C/D and the jetty belts are open at the top and have limited cladding at the sides for safety and operational reasons. Belts 12A and 12B feed from an underground slot hopper which is only used in an emergency. The towers generally support the conveyor bridges so it would not be possible to remove the towers without first dismantling the adjoining conveyor. Refer to Planning Drawings QP-000017-65-D451-004-001-000 to 004-003-000 for existing site layout plan.

The other main conveyors are 13A and 13B (called the rising conveyors) which feed from Tower 8 to the top of the station bunker house (Figure 4.8), where they then feed onto a series of internal bunker transfer conveyors. In addition to the various storage sheds there is a three-floor control building which has a control room, relay room, switchgear and welfare facilities.

A number of options were considered for coalyard dismantling given the requirement to continuously inspect and maintain out of service plant, the requirements of future projects and the fact that the jetty, oil unloading arm, HFO supply pipework and trace heating will be required to receive marine HFO deliveries until 2029. There will also be an environment management requirement until such time the full coalyard and jetty is fully removed/remediated.

The four alternatives considered include:

- Retain all coalyard plant (do nothing alternative)
- Demolition/dismantling of all coalyard furniture (Option 1)
- Demolition/dismantling of landside coalyard furniture (Option 2)
- Dismantling of vulnerable infrastructure only (Option 3)

3.7.1 Do Nothing – Retain All Coalyard Plant

In this option all coalyard bulk materials handling plant will be retained following the conversion to 100% HFO in 2025. The plant will need to be maintained and managed to ensure the structural integrity and environmental risks are managed.

3.7.2 Option 1 – Demolition/dismantling of All Coalyard Furniture

This option involves demolition/dismantling of all coalyard furniture from the jetty to the bunker bay entrance including the following.

- Two Ship unloader structures, excluding the jetty rails
- Two Stacker/reclaimers, excluding the stockyard rails
- Towers one to nine internals and building structure down to concrete floor slap
- Conveyors bridges 2, 3, 4, 5, 6, 7, 8, 12(A/B) including internals conveyor, structure and supports down to the concrete slabs
- Rising conveyor bridge 13 from source at tower 8 to where it enters the bunker building. Both internal conveyors to point of delivery onto belts 14A and B, and extensive structure supports down to the concrete foundation
- Yard belts 12C and 12D including support structures and winch house to ground foundations
- Jetty belts 1A and 1B including support structures down to foundation bolts
- Check weight hopper internals and building structure down to concrete floor slab

- Emergency slot hopper internal equipment but not the underground structure
- Switchgear building x 3 (connected to various towers)
- Main control building – however provision will need to be made to temporary relocate switchgear and C&I required for oil unloading functions.

This option would clear the whole site in preparation for the Green Atlantic @ Moneypoint project whilst maintaining the integrity of any existing drainage, environment, fire and maintenance facilities required for ongoing maintenance of the area. The removal of the coalyard control or other switchgear building would need to be fully reviewed and alternatives planned/scheduled so as not to jeopardise future HFO deliveries. Therefore, this option is not considered a reasonable alternative at this stage.

3.7.3 Option 2 – Demolition/dismantling of Landside Coalyard Furniture

This option involves demolition/dismantling of coalyard furniture on landside only, from tower 2 to bunker bay entrance including the following.

- Two Stacker/reclaimers, excluding the stockyard rails
- Towers three to nine internals and building structure down to concrete floor slap
- Conveyors bridges 3, 4, 5, 6, 7, 8, 12(A/B) including internals conveyor, structure and supports to the concrete slabs
- Rising conveyor bridge 13 from source at tower 8 to where it enters the bunker building. Both internal conveyors to point of delivery onto belts 14A and B, and extensive structure supports down to the concrete foundation.
- Yard belts 12C and 12D including support structures and winch house to ground foundations
- Check weight hopper internals and building structure down to concrete floor slab
- Emergency slot hopper internal equipment but not the underground structure.
- Three Switchgear buildings.

This option excludes the main coalyard control room which contains related switchgear and C&I for jetty equipment and oil unloading. The following items are excluded from this option:

- Ship unloader structure x 2
- Towers 1 and 2
- Conveyor bridge 2 and associated belts
- Jetty belts 1A and 1B and associated structure.

This option is similar to Option 1 in that it clears a large section of the coalyard site in preparation for the Green Atlantic @ Moneypoint project whilst maintaining the integrity of any existing drainage, environment, fire and maintenance facilities required for ongoing maintenance of the area. The coalyard control building is retained in this option as it may be needed to provide power and C&I for the jetty assets until such time that they are repurposed or demolished. As the control building site may be needed for the Green Atlantic @ Moneypoint project, a full review will be required before committing to alternatives solutions which may have a significant cost. For these reasons, this option is not considered a reasonable alternative at this stage.

3.7.4 Option 3 – Dismantling of Vulnerable Infrastructure Only

This option involves dismantling of infrastructure that requires significant ongoing maintenance cost to ensure structure integrity, i.e. those items have been significantly exposed to prevailing weather and are of a significant height to cause safety concerns.

- Two Stacker/reclaimers, excluding the stockyard rails

- Rising conveyor bridge 13 from source at tower 8 to where it enters the bunker building. Both internal conveyors to point of delivery onto belts 14A and B, and extensive structure supports down to the concrete foundation.
- Drain all drives, gearbox, trafo's etc that are not used.

The following is also excluded in additional to those items excluded in Option 2 (Section 3.7.3).

- All towers and remaining conveyor bridges excluding 13.
- Yard belts 12C and 12D
- Check weight hopper
- Emergency slot hopper internal equipment but not the underground structure
- Switchgear buildings.

This option only includes dismantling equipment that have high exposure to prevailing wind and rain and significantly reduces the safety risk due to structural integrity or cladding coming loose. Indeed, rising belts structures have failed at other UK power plants i.e., Longannet. The stackers and reclaimer's height and counterweight would be subject to ongoing high stress. Both pieces of equipment are above ground and would be reasonably easy to remove without major environmental issues.

The only other key infrastructure that will require significant ongoing maintenance to ensure structure integrity would be the ship unloaders however initial plans is that these may be repurposed for future Green Atlantic @ Moneypoint uses which is in the early design and feasibility study stages.

All options provide a clear signal of ESB transition from coal by removing the ability of Moneypoint to convey coal from the coalyard for station fuelling purposes. The retention of the jetty for HFO unloading is essential unless an alternative facility is developed. The retention of the control building will be required until an alternative solution is engineered for the MV/LV supply and C&I for the HFO unloading system.

The preferred solution is Option 3 as it removes the majority of the high-risk plants whilst confirming Moneypoint's commitment to stop firing coal after 2025.

3.8 Conclusion

From the onset of the design process and during the consideration of alternatives, environmental constraints were considered and avoided, where possible.

As stated in Section 3.2.2, alternative sites were not considered a reasonable alternative for proposed development as the majority of the existing infrastructure at Moneypoint Generating Station can be utilised, thereby negating the need to undertake extensive works as part of this proposed development and mitigating potential environmental impacts by avoidance. The proposed development will not require the acquisition or development of any greenfield areas, mitigating by avoidance, potential environmental impacts. The proposed development will also facilitate the strategic positioning (with regard to the availability of suitable and appropriate existing land within the site) of the future Green Atlantic @ Moneypoint project.

Coal is considered unsuitable for security of electricity supply generation given deterioration in the coalyard, complex fuel handling systems, and moisture pickup resulting in delayed starts and unreliability. The continued operation on coal and continued use of consented FGD by-product storage will also have a knock-on effect on the development of the Green Atlantic @ Moneypoint. As discussed in Section 3.3.3, the proposed option for alternative technology and fuel is Heavy Fuel Oil. HFO provides greater flexibility for intermittent operation when compared with coal. It also aligns with ESB's Net Zero Strategy and stated position to cease coal firing by

2025. The other alternatives considered, gas conversion and biomass co-firing, would require a significant amount of additional time and construction works which have the potential of much greater and more complex environmental impacts.

For fuel arrangement (Section 3.3), the proposed option is to construct two new HFO tanks. This option offers potential to improve the overall containment of the HFO bunds on site whilst ensuring minimal reconfiguration of HFO pumping and piping.

For the new auxiliary boilers (Section 3.4), the proposed option is one 22.7MW distillate boiler and one 22.7MW electric boiler. This option facilitates a reduced start up time, increased starting reliability, ensures the plant can remain in the cold standby state, reduced start-up of a second unit, provide significant redundancy and increased boiler reliability. This option provides lower emissions than the distillate only option and has the added advantage of using low-cost renewables for heating and temperature retention.

The proposed option for ash storage modifications (Section 3.5) is to increase the capping layer thickness of the ASA from 0.6m to approximately 1.6m, to store the excess FGD by-product produced in the period post 2025. This option prevents the opening of a new repository site (FGD Landfill Area B) and associated environmental risks and long-term management requirements, as well as ensuring the future availability of that area for the Green Atlantic @ Moneypoint project. This option is preferred over the option discussed in Section 3.5.2 as the latter will require disturbance of the existing ASA and movement of stored ash. This would result in considerable additional HGV traffic on site and potential for additional related environmental impacts.

For the ash recovery (Section 3.6), the proposed option is to reclaim PFA from the ASA and direct injection of reclaimed wet PFA into the FGD absorber. From an environmental perspective, this option provides advantages over other options discussed. An increase in free lime dosing (Section 3.6.1) would increase the use of raw materials. The repurchasing of dried ash from cement contractors (Section 3.6.2) would not achieve the circularity goal for the system. Wet ash injection into the boiler (Section 3.6.3) would not achieve required IE Licence ELVs for the FGD process. The drying process as part of the option discussed in Section 3.6.4 would be an energy intensive process in comparison with the preferred option.

The preferred option for the decommissioning of the coalyard (Section 3.7) is to dismantle vulnerable infrastructure. This includes stacker reclaimers and conveyor belts. Both pieces of equipment are above ground and would be reasonably easy to remove without major environmental issues.

4 Description of the Proposed Development

4.1 Introduction

Moneypoint Generating Station comprises a large complex of structures. Electricity generation occurs at three 300MW rated coal-fired units, which entered service between 1985 and 1987. A service road was developed beneath the N67, linking the station with the northern 50 hectare parcel of land, where the station's ash disposal facility was developed. As mentioned in Section 1.3, Moneypoint Generating Station lies within ESB's 180 hectare onshore landholding.

Moneypoint Generating Station is a coal fired station with HFO used as a start-up fuel and in limited circumstances. Coal and HFO are delivered to Moneypoint by ship via the dedicated jetty located on the southern boundary of the site. Distillate, as diesel and propane, which are used as startup fuels, are delivered to the site by road. Further key features of the site are identified on Figure 4.1.

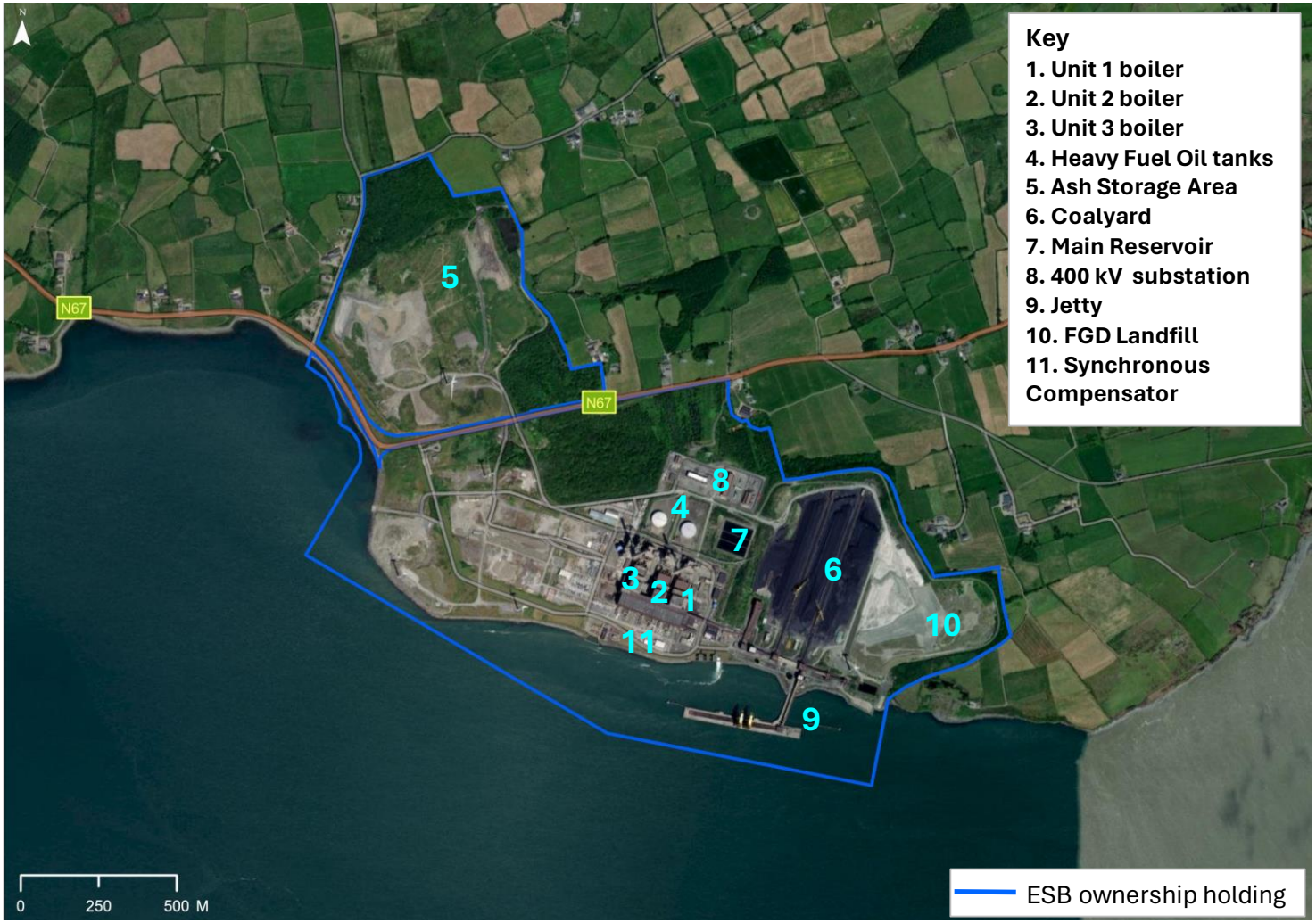
ESB propose to transition and convert the primary fuel source at Moneypoint from coal to HFO with limited run hours (described in terms of generating hours, per unit, per year) from late 2024 until late 2029 when Moneypoint Generating Station will cease generation.

HFO for the units will be provided from the existing two HFO storage tanks and two new HFO tanks with upgraded bunding. HFO deliveries will be via marine oil tanker and off loaded at the existing oil jetty using the existing infrastructure. Two (2 No.) new auxiliary boilers, one diesel boiler and one electric boiler, are proposed to be located in a new auxiliary boiler house. Distillate for the diesel auxiliary boiler will be supplied from the existing distillate (diesel) storage tanks and forwarding system. Distillate (diesel) will still be delivered by road tanker. The second auxiliary boiler will be electrical fired and will import power from the grid under the existing connection agreement with EirGrid.

There will be no change to the existing generating boilers, turbines, transformers or associated equipment. No changes to the HFO forwarding systems will be required to facilitate the proposed transition to HFO. Each unit is connected to the national grid through the existing 400kV substation which will not change.

The Moneypoint Generating Station site operates, and will continue to operate, under the existing Industrial Emissions licence (Register Number: P0605-04), regulated by the Environmental Protection Agency (EPA).

Figure 4.1: Key Features of Moneypoint Generating Station (existing)



Source: Mott MacDonald (Satellite imagery source: Maxar, Microsoft, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS')

4.2 The Proposed Development

ESB is proposing a development consisting of the following elements:

1. Transition and conversion of the existing coal fired power station's primary fuel from coal to Heavy Fuel Oil (HFO) for limited hours of operation and a temporary period of five years until the 31 December 2029;
2. Construction of 2no. HFO tanks each with a capacity of 25,000 tonnes (approx. 48.7m diameter x 15m high) and associated bund walls (approx. 5.0m high);
3. Construction of a new boiler house (approx. 24m L x 18m W x 11m H) to house 2no. auxiliary boilers (1no. electric and 1.no distillate, each 22.7MW (thermal output), including:
   - 1no. Blow down vessel (approx. 4.5m wide x 13m high)
   - 1no. Exhaust Stack (approx. 1.0m diameter and 30m H)
   - 1no. Annex structure (approx. 10.0m L x 5m W x 4m H)
4. Construction of an extension to each of the existing 3no. Flue Gas Desulphurisation Absorbers (FGD) - units 1, 2 and 3, to provide additional reclaimed ash unloading facilities (ash injection plant extension), comprising:
   - 1no. conveyor enclosure (approx. 7.0m L x 2.5m W x 22m H)
   - 1no. hopper enclosure (approx. 6m L x 5m W x 6m H)
5. Construction of a reclaimed ash unloading facility at the existing landfill capping batching plant, comprising of a hopper enclosure adjoining the existing batching plant (approx. 14.0m L x 6.5m W x 6.0m H) and conveyor enclosure (approx. 3.5m L x 3.5m W x 11.5m H)
6. Dismantling and removal of 2no. mobile stacker reclaimers and 1no. coal conveyor bridge;
7. Changes to existing permitted Flue Gas Desulphurisation (FGD) by-product and Ash Storage Area (ASA) arrangements (Pl. Ref. 14/373) to utilise spare capacity in the existing ASA [capping layer thickness increase from 0.6m (*minimum*) up to a maximum of 1.6 meters] with an overall proposed reduction in height of the currently permitted ASA by approx. 1.85m; and,
8. All associated ancillary site development works to facilitate the proposed development, including a new lighting arrangement, surface water drainage, internal roads and temporary construction compounds and laydown areas.

The details of the proposed changes are discussed in sections below and are also presented in the Proposed Site Layout planning drawings, QP-000017-65-D451-005-001-000 to 006-006-000.

Subject to a grant of planning permission, it is intended that the proposed development will result in the phasing out of coal sourced energy production and provide opportunity to support renewable energy infrastructure in its replacement from 2029 onwards. Final decommissioning of the station and any future use of the site beyond 2029 will be subject of a separate grant of planning permission. There are no project interdependencies between any future developments and the proposed development.

4.2.1 Transition and Conversion to HFO

ESB propose to transition and convert the primary fuel source at Moneypoint from coal to HFO with limited run hours (described in terms of generating hours, per unit, per year) from October 2024 until the end of 2029, when Moneypoint Generating Station will cease generation.

The existing generating units were originally designed to be fuelled using 100% coal, 100% HFO or a combination of both. The IE licence also states that all units are dual-fired, capable to fire full load on coal and/or HFO.

It is currently part of normal operations to co-fire HFO and coal during start-up, and during full load if there are issues with flame stability using coal only. HFO is also utilised for load changes and during maintenance or repairs. In exceptional circumstances individual units have been fired on 100% HFO for short periods.

The majority of the existing infrastructure at Moneypoint can be utilised without significant, if any, modification thereby negating the need to undertake extensive works to the generating units and associated infrastructure themselves. There is therefore no requirement, beyond normal maintenance and repairs, for upgrades to the generating station itself, other than as described in this section, to fuel the generating station using HFO.

The Targeted Contracting Mechanism (TCM) agreed between ESB and EirGrid is from 2024 to 2029 at limited run hours for security of electricity supply purposes (see Section 2.2 for further detail).

Under the conditions of the TCM the plant will no longer be a base load plant in the energy supply market. The proposed development will operate as an out of market generator of last resort for an average of 3,000 hours per annum per unit. Typically, the plant will run during the winter months and at times of low renewable generation e.g. low wind and solar energy production. This contrasts significantly with the existing regime whereby generation can take place 365 days, 24hr per day at all three units i.e. up to 8,760 hours per unit per year (total 26,280 hours over three units).

While it is envisaged the station will operate for an average of 3,000 hours per unit per year over the TCM period; each of the three units must also be available to operate for up to 5,000 hours per unit per year to provide capacity in times of extreme tightness in the electricity system. Regardless, the total maximum run hours across the three units over the full five-year period of the TCM will not exceed 45,000 run hours. All environmental assessments of this proposal have considered impacts arising from this maximum running time of 45,000 hours across the three units over the five years.

Whilst run hours will be limited to times of grid stress, the station will be required by EirGrid to operate on a must run basis. It is EirGrid that will ultimately control the number of hours that each unit must run, and this decision will be made based on the supply of and demand for electricity at any time.

Given that it is ESB's stated policy to cease coal firing by 2025, it is proposed to run down coal stocks up to the end of 2025. A transition period of co-firing, from October 2024 to the end of 2025 will be required to ensure all remaining coal in the coal yard can be consumed. During this period one or more units may be fired using a combination of HFO and coal or fully on one fuel or the other. From the end of 2025 it is proposed to cease coal firing fully and fuel the plant solely using HFO with distillate (diesel) and propane used for start-up and shut down.

4.2.2 Proposed New HFO Tanks

The two new HFO storage tanks are proposed to be located within the existing bunds to the north of the existing tanks, as shown in Figure 4.4. The HFO and auxiliary steam connections will be tied into the existing supply and return pipework and will utilise the existing HFO forwarding pumps and HFO supply line from the Jetty.

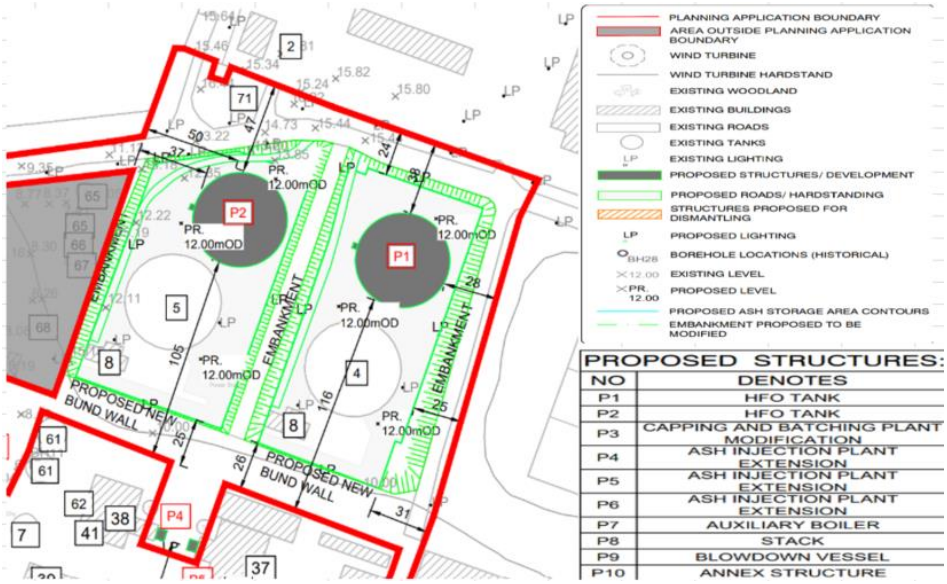
The tanks will have a proposed capacity of 25,000 tonnes (ca. 25,773m^3) each. This will result in a total HFO storage capacity of 100,000 tonnes or 20 days of storage running at full capacity.

The proposed tanks will be the same height and diameter as the existing tanks as shown in Planning Drawings QP-000017-65-D451-008-001-000 to QP-000017-65-D451-008-004-000.

They will be clad in a similar coated metal finish in Dusty Grey (RAL colour 7037) or similar, to match the colour of the existing tanks.

Existing HFO pumping and piping will be used for the purposes of filling the new and existing HFO tanks as well as supplying the boilers with fuel. Only new connections to the new tanks will be required.

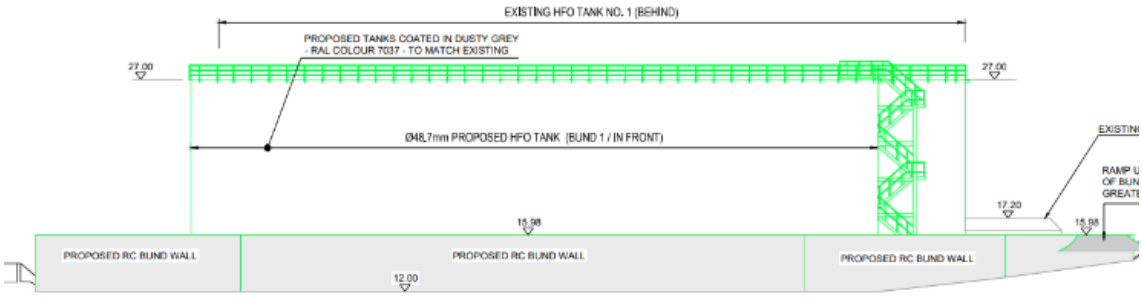
Figure 4.2: Proposed HFO tanks



Source: Extracted from Planning Drawing QP-000017-65-D451-005-001-000

The existing bund will be upgraded to include a concrete floor across the entire bund. New bund walls will be constructed from reinforced concrete to a height of approximately 3.98m (bund 1) to 4.41m (bund 2), to ensure containment volumes of ca. 30,406m^3 and ca. 30,545m^3 respectively. This takes into account 110% of the largest tank oil volume, a potential extreme rainfall event to cover any emergency response periods and an additional 3,981 m^3 for any potential firefighting water to take into account requirements in the Guidance Note to Industry on Fire Water Retention Facilities (EPA, 2019) and CIRIA Guidance C736. Refer to Figure 4.3 for an example elevation of tank 1 and bund 1 and to Section 2 of the Drainage Report (Appendix H.1 of this EIAR) for further details.

Figure 4.3: Proposed Bund Wall NE Elevation – Tank 1



Source: Extracted from Planning Drawing QP-000017-65-D451-008-004-000

Due to the proposed increase in height of the bund walls, the access ramp will be upgraded to ensure a safe gradient is maintained, this ramp from the roadway to the north of the HFO storage area will be raised by ca. 1.4m to allow access into the bund. Lamp posts will also be installed to the permitter of the bund.

4.2.3 Proposed Auxiliary Boilers

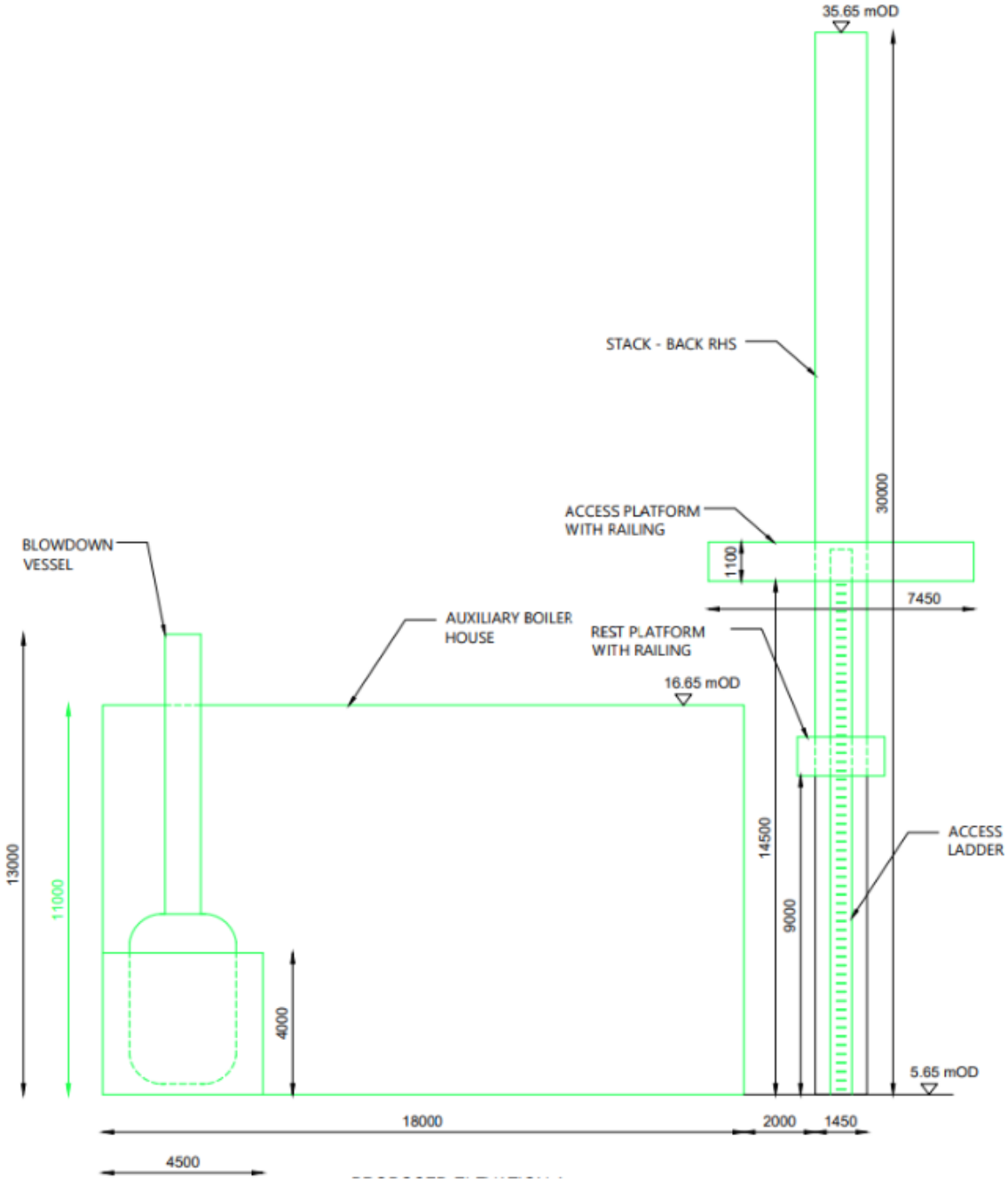
Two (2 No.) new auxiliary boilers are proposed to be located in a new auxiliary boiler house, to the west of Unit 3 boiler house and close to an existing pipe rack with the necessary services. The purpose of these boilers is for HFO and deaerator (D/A) heating, and boiler start up. It is proposed to include one electric and one diesel fired boiler each ca. 22.7MW (thermal output). See Section 4.4.1.1 regarding the operation of these auxiliary boilers.

It is envisaged that the electric boiler will be the primary auxiliary boiler to be used while the plant is on standby due to its faster start up time and reduced GHG emissions. However, the diesel auxiliary boiler will also start up during times of electricity supply shortfall where the energy for the electric auxiliary boiler may not be available and during multiple unit starts. Designs have been developed on the basis of 15 cold unit starts and 15 warm unit starts but ultimately the number of starts will be dependent on electricity supply and demand and will be controlled by EirGrid.

The proposed diesel auxiliary boiler stack is located at the southwestern corner of the proposed boiler house and is proposed to be 30m in height. This will be metal clad. As required in the IE licence, an access platform for the purposes of emissions monitoring is proposed in line with Guidance Note on Site Safety Requirements for Air Emissions Monitoring (AG1) (EPA, 2020), Air Emissions Monitoring Guidance Note (AG2) (EPA, 2021), Guidance Note on monitoring of Stack Gas Emissions from Medium Combustion Plants (AG11) (EPA, 2021) and EN15259. It is proposed that the platform will be located 14.5m above ground level, 360 degrees around the stack at a depth of 3m from the stack. A railing is provided for at a height of minimum 1.1m above the platform. The platform is proposed to be accessed via an access ladder on the west side of the stack from ground level. The access platform and associated structures will be constructed from galvanized steel. Figure 4.6 shows the proposed elevation for the boiler house. Refer to drawing QP-000017-65-D451-011-001-000 for further details.

The building finish will be clad in metal cladding coated in a Sepia brown (RAL Colour 8014), or similar.

Figure 4.4: Boiler House Northern Elevation



Source: Extracted from Planning Drawing QP-000017-65-D451-011-001-000

4.2.4 Changes to FGD By-product and Ash Storage Area Arrangements

When the existing FGD by-product Landfill Area A reaches full capacity, it is proposed to utilise the spare capacity in the existing ASA to store the FGD by-product. At present bottom ash, which is generated in the furnace and is a much courser ash, is segregated in separate cells within the ASA and discussion are ongoing with block manufacturers regarding using this material as a substitute in low density blocks.

Fly ash, or what is often referred as PFA, is collected form the flue gas and is typically drier and finer. It is stored dry in three storage silos on site, before either being sold to cement

manufacturers as a cement substitute or conditioned with water before being landfill in the ASA. Sales of PFA have been dropping over the last number of years due to lower cost of alternatives and the longer transport distances.

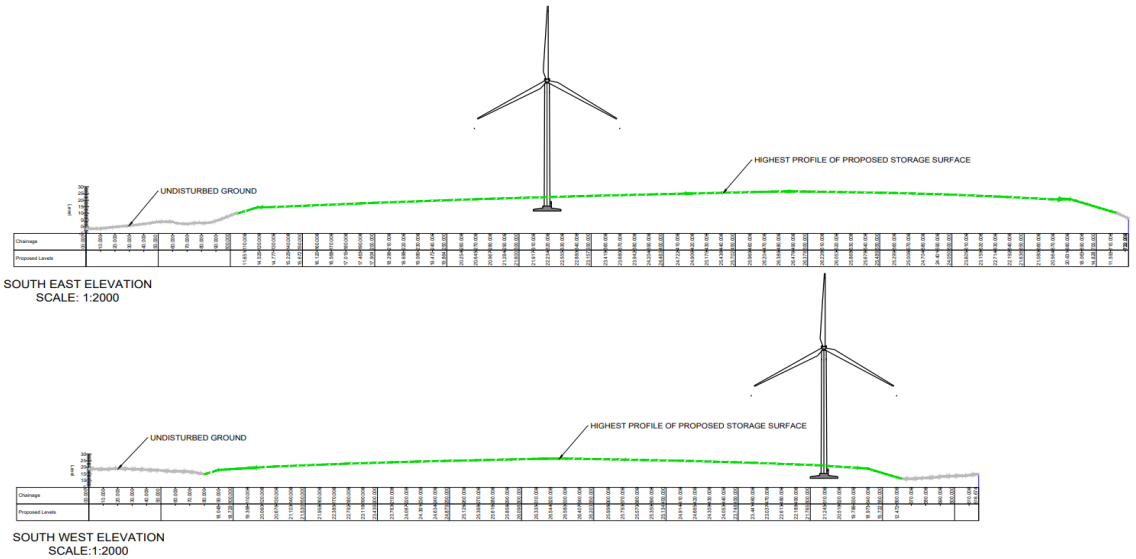
The reclamation of ash from the existing ash area appears to have been considered in the IE licence under Condition 10.6.2 – *"The final capping shall, as and where appropriate, be designed and constructed to facilitate the future recovery of ash deposited in the landfills".* Note that approval will be required from the EPA in accordance with the relevant Waste Regulations.

Given that FGD Landfill Area A is nearing capacity and the land use requirements for area B as set out in Section 3.5, FGD by-product produced in the period 2025 to 2029, will require an alternative storage arrangement. Furthermore, relatively little ash and significantly less FGD by-product will be produced in the years 2025-2029 compared with continuous operation fuelled by coal. The ash concentration as a result of HFO combustion is a maximum of 0.15%, compared to coal firing, which has an ash concentration of 7.7% to 9.1%. There will therefore be negligible volumes of ash to be stored once the plant is fuelled using HFO. It is therefore proposed to utilise the spare capacity in the ASA by increasing the cap thickness for the purposes of managing ash and FGD by product for the years between 2025-2029.

It is proposed to increase the thickness of the FGD/Ash capping layer from 0.6 m up to a maximum of 1.6 m in order to store all the FGD by-product produced during the years 2025 to 2029. This coupled with a reduced quantity of ash to be stored overall will result in a reduced height of up to 1.85m when compared to what was granted under permission P14/373 while maintaining the same profile.

It should be noted that the final volume of FGD material produced and therefore the final ASA height will be highly dependent on run hours. As noted previously, EirGrid will have control on how many run hours the plant is operational for and therefore the amount of FGD material produced. The final profile may be at a lower level. As was previously permitted, once complete the final profile will resemble a dome-like shape and will be finished with a layer of topsoil and seeded with meadow grass mix of native provenance, as shown in the Figure 4.5.

Figure 4.5: Proposed ASA Profile (South East and South West Elevation)



Source: Extracted from Planning Drawing QP-000017-65-D451-023-001-000

A chemical/physical analysis is presently ongoing to ensure HFO generated PFA/FGD by-product has similar physical and chemical properties of coal generated material. Periodic sampling and analysis is undertaken and the results submitted to the EPA as a condition of the IEL for their review and agreement.

A feasibility and high-level design study by a materials handling specialist has proposed a reclaimed truck unloading facility to the west of the Batching plant, and direct feed of the wet reclaimed ash upstream of the existing batching mixer into the existing dry PFA feed line. This proposal utilising the existing batching plant and weighbridges will ensure a consistent blended capping material is produced. A summary of the proposed solution:

- Recovered ash from the ASA will be dumped into a lorry unloading hopper to the west of the Batching plant. Dust will not be an issue however a partial housing should be instructed to minimise wind and rain impacts.
- Ash is then fed to a series of rotating disks/shredders which ensure all lumps are broken down and the material is retuned to a fine consistency.
- Conditioned ash is then raised to the 12.3m level and injected into the existing PFA inspection points on mixer A and B.
- Mixing rates will be controlled by varying the speed of the feeder screw. The existing feed control system can be modified to incorporate this new source.
- Any process dust will be vented into the existing extraction system.

4.2.4.1 FGD By-product Batching

As stated in Section 3.5, ASA site capping and berm construction comprises a mixture of 47.5% fly ash, 47.5% FGD by-product and 5% cement. The capping material is mixed in the batching plant building upstream of the pipe conveyor and truck loading bay, water is added to the mixture to bring the moisture ratio to 15%.

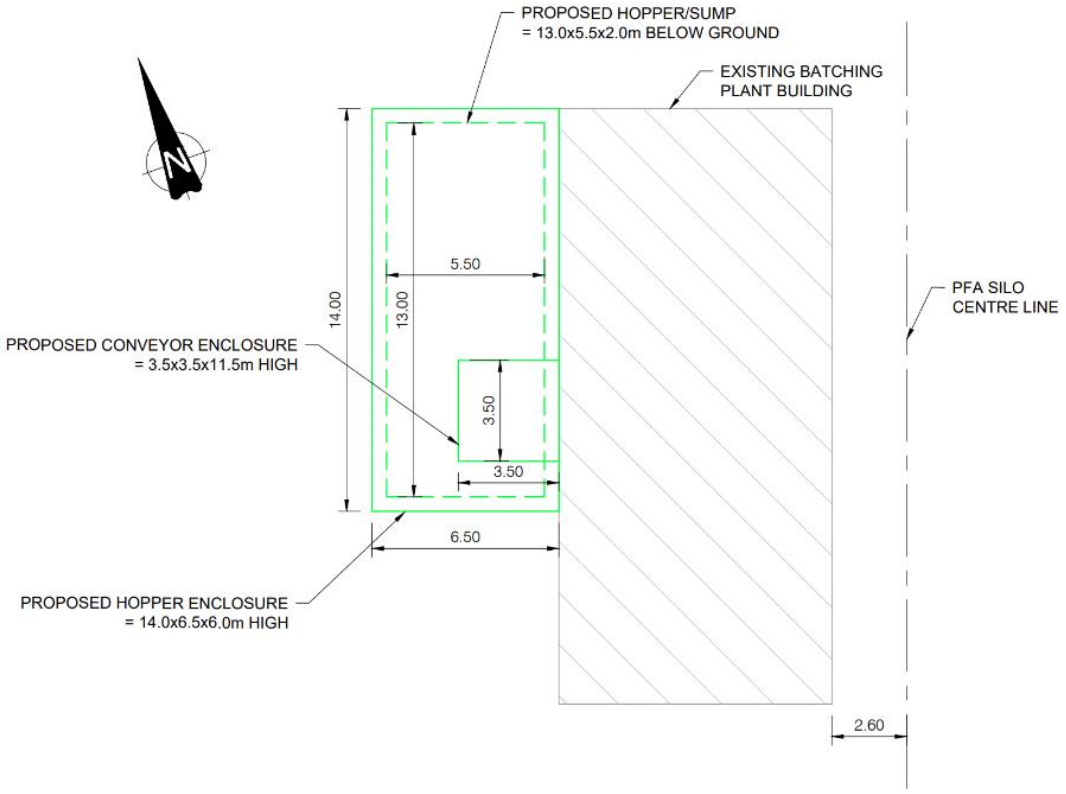
The proposed capping material has been tested and has similar properties and permeability as the existing blend. Minimal leachate is produced through the proposed capping blend and relevant topics will be included in the Annual Landfill Status Report to ensure compliance with Schedule F of the current IE licence.

After the plant begins operation on HFO, an insufficient volume of fly ash for capping material batching will be produced. Hence, ash will need to be reclaimed from the ASA and mixed in accordance with the capping material ratios above. This will ensure consistent minimum permeability rates to those in the existing ASA arrangements. See Section 3.6 (Ash Recovery for FGD System), for details.

Fly ash is proposed to be recovered by front loader or excavator at the ASA. It will then be transported by dumper truck to the existing capping material batching plant via the existing underpass under the N67. It is proposed to be tipped into a new hopper sump located adjacent to the existing batching plant. From this hopper it is proposed to be conveyed into the existing batching plant where it will be blended with FGD by product and cement before being returned to the ASA as capping material. Planning Drawing QP-000017-65-D451-015-001-000 shows the proposed modifications to this batching plant as presented in Figure 4.6.

The cladding to this building extension will be a brown cladding (RAL 8014), or similar, to match the existing.

Figure 4.6: Proposed Batching Plant Building & Hopper Modifications



Source: Extracted from Planning Drawing QP-000017-65-D451-015-001-000

4.2.5 Ash Reclamation for FGD System

Ash is required in the flue gas desulphurisation (FGD) system to create a fluidised bed for the process. HFO ash content is up to 0.15% compared with 7.7%-9.1% for coal. Fly ash in the flue gas when fuelled by HFO is therefore significantly reduced and is not sufficient to create fluidised bed conditions in the FGD system. When firing with HFO alone it is proposed to reclaim ash from the ASA for use in the FGD system to create the required fluidised bed conditions.

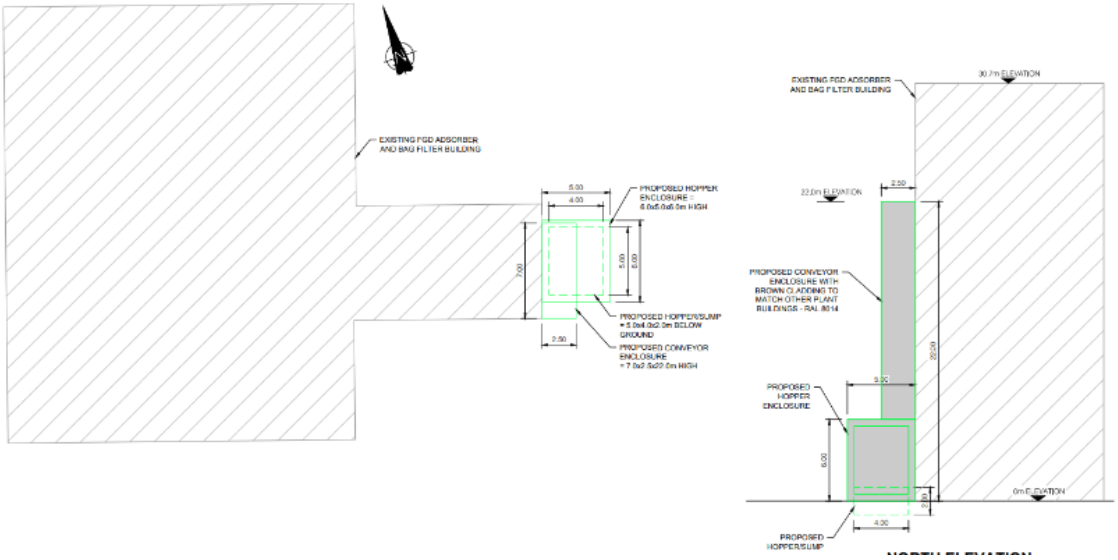
Based on experience, it is likely that approximately 30 tonnes per unit per week of fly ash will be required for bed stability. This equates to approximately 120 tonnes per week, allowing for an additional 30 tonnes for any free lime fluctuations and flexible operations i.e. multiple starts and stops. This approximate 120 tonnes of ash per week will be recovered from the newer fly ash cells using a low loader or excavator and tipper truck. The tipper truck will transport the material via the existing underpass under the N67 to underneath the existing ash storage silos. Once coal firing ceases, these ash storage silos will no longer be in use. From here ash will be transported using a separate low loader to one of the three (3No.) proposed five tonne shovel feed hoppers below the existing 3No. FGD absorbers. This reclaimed ash will then be fed back into the FGD process through a proposed system of bucket conveyors, shredders and screw conveyors. All of this equipment will be contained within the proposed new building annex. The

details on waste generated and waste management are discussed in Chapter 16 Material Assets and Waste Management.

A plan and north elevation of the proposed structure at Unit 1 is presented in Figure 4.7, see Planning Drawing QP-000017-65-D451-016-001-000 for further details.

The proposed building annexes will be clad in a brown cladding (RAL 8014), or similar, to match the existing.

Figure 4.7: FGD Ash Injection – Unit 1



Source: Extracted from Planning Drawing QP-000017-65-D451-016-001-000

4.2.6 Surface Water Drainage

The addition of two new HFO tanks necessitates a refurbishment of the existing earthen HFO bunds. This upgrade will include the addition of an impermeable liner and provision of walls within the bunds. The new floor shall be capped with a 200mm thick reinforced concrete slab.

A network of gullies, aco channels (or similar) and surface water pipelines will be required to convey stormwater to the south of each bund. As with the existing surface water drainage system, discharge of the proposed surface water from the bund areas will be controlled by a manually operated valve. The valve will, as is currently the case, be set to closed position and only opened following inspection in accordance with the IEL conditions to drain each bund. The pathway taken by surface water from here will follow the existing drainage lines to the IEL Surface Water Drain SW2 via an upgraded oil/water separator. The presence and careful management of settling chambers and a shut-off valve upstream of the existing Class 1 full retention oil separator ensure that it will continue to have adequate capacity to treat the additional impermeable area being drained to it.

The proposed auxiliary boiler house, batching plant and FGD ash injection containment building will require roof drainage which will connect into nearby existing surface water drainage but will not necessitate any prior treatment nor flow control measures given the capacity of the downstream drainage network.

For more information on the surface water drainage proposals refer to Chapter 11 Surface Water Resources and Flooding.

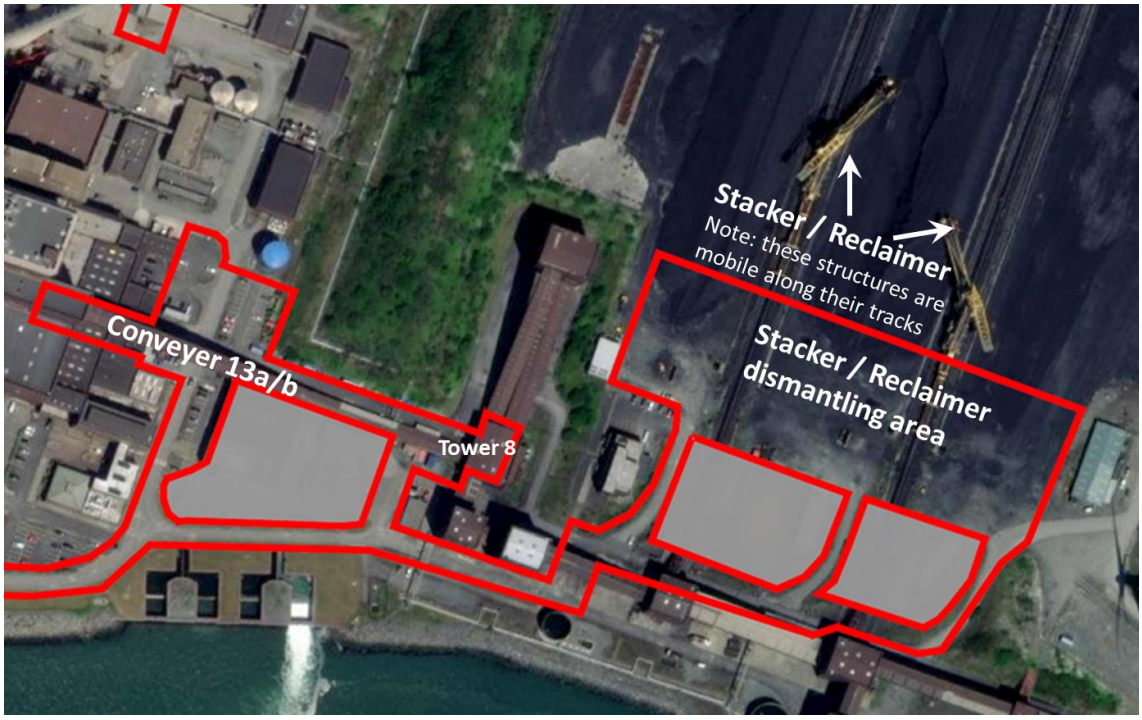
4.2.7 Partial Dismantling and Removal of Coal Handling Plant

The plan is that the coalyard operation will cease in December 2025 as part of the planning application for the proposed development. The expectation is that coal burning will cease at mid-2025 through careful coal stock management. A six month period has been allowed for any residual coal to be used and any coal recovery process to be embarked on in order to minimise coal residual volumes. It is proposed to dismantle and remove the stacker reclaimers within the coal yard and rising conveyors 13A and 13B to ground level. These are largely metal structures and dismantling will be by controlled dismantling only. See Figure 4.8 and Planning Drawing QP-000017-65-D451-003-001-000 to 003-003-000 for further details.

The scope of this planning application includes the main body of each stacker reclaimer along with the intermediate conveyor structure and main machine ballast. Conveyors 13A and 13B run from ground level at Transfer Tower 8 to the top of the Bunker Bay located between the Turbine Hall and Boilers. In addition to the conveyors, the structural supports and the weather housing structure are to be removed. The ground level reclaimer travel tracks are excluded from the scope of this planning application.

All works will be limited to the removal of the above ground plant/structures, to top of slab/ground level. The opening in the side of the main station building bunker bay will be re-cladded following removal of the rising belt conveyor and associated structure.

Figure 4.8: Limited Dismantling of Coal Handling Equipment



Source: ESB QP-000017-65-D451-003-001-000 to 003-003-000 Site Location (Aerial) -1 of 3

4.2.7.1 Closure Tasks and Programmes

The decommissioning and dismantling of the rising conveyors (13A and 13B) and the stacker reclaimers will involve the following tasks:

- Parking of the stacker reclaimers within the works area
- Hazardous Material Survey
- Plant and Equipment Decontamination
- Plant and Equipment Decommissioning
- Dismantle of Coalyard Equipment

Further details on each of these tasks are set out in Section 4.2.7.2 to Section 4.2.7.6.

4.2.7.2 Parking

The stacker reclaimers are mobile along their tracks. They will first be parked within the proposed works area as shown in Drawing QP-000017-65-D451-005-001-000 and QP-000017-65-D451-006-001-000.

4.2.7.3 Hazardous Insulation Material Surveys

Prior to any works taking place ESB will undertake an inspection to identify the presence of all hazardous materials used in the construction of the structures and within the plant. Such materials can include; asbestos, refractory ceramic fibres, ozone depleting foams, Polychlorinated Biphenyls (PCBs) in transformer oils, etc.

Where possible these will be removed prior to dismantling, however it is anticipated that there will be no hazardous insulating materials in the plant and structures to be demolished, as part of the dismantling works. The use of specialist contractors and the production of task specific method statements in line with relevant legislation and best practice will be implemented as per the CEMP and the RWMP (Appendix C). The measures in place in case of encountering hazardous materials are discussed in Chapter 12 Land, Soils and Hydrogeology.

4.2.7.4 Plant and Equipment Decontamination

The two known substances that require removal are remaining coal (dust) and residual oils in machinery (motors, etc.). The structures to be dismantled and decommissioned will be washed down to remove and collect coal which will be disposed of or recycled. All waste will be managed in accordance with the Waste Management Act 1996 and associated regulations. A construction Resource and Waste Management Plan (RWMP) is provided in Appendix C of this EIAR, refer to Section 4.3.9 for further details. The level of coal decontamination will be determined to ensure that the demolition methodology (Section 4.2.7.6) does not result in significant airborne organic dust. Any remaining coal dust and coal, not removed previously, will be managed collected, and disposed of by the demolition contractor. Dust monitoring and suppression methods will be in place during demolition.

Oil will be drained, collected, and disposed of from all machinery. It should be noted, however, residues will still be present.

4.2.7.5 Plant and Equipment Decommissioning

All plant and equipment will be isolated and air-gapped from respective services (cabled and piped). Documentation will be provided to confirm isolations.

4.2.7.6 Dismantle of Coalyard Equipment

It should be noted that the selected contractor will be suitably experienced to undertake the dismantling works. A detailed pre-qualification process prior to inviting tenders will be caried out.

Stacker reclaimers will be dismantled in one of two general methods:

- Controlled collapse to ground level for processing, or
- Stacker reclaimers will be pre-weakened (following a detailed structural engineering assessment and justification) and collapsed. Once on the floor the structures will be size reduced utilising shears mounted on demolition excavators and secondary processing by hot cutting.
- Dismantling by large section crane lifts.
- Sections of the structures will be piecemeal removed (following structural assessment to ensure temporary stability is maintained), using at least two cranes, with the items progressively lowered to ground level for further size reduction using hydraulic shears mounted on demolition excavators and secondary processing by hot cutting.

Conveyors 13A and 13B will be dismantled in the following manner.

- Firstly, the length supported above ground level will be lifted down in sections (including support legs), utilising two large mobile cranes with a third smaller support crane, and mobile platforms.
- Each section will be laid down to the east of the power station (adjacent and on the eastern road) where demolition excavators will initially size reduce them prior to secondary processing by hot cutting.
- The opening formed in the eastern elevation of the bunker bay due to the removal of the conveyors will be sealed using sheeting purlins and steel sheeting to match existing (reused from removed conveyors).
- The section from Transfer Tower 8, to approximately halfway to the bunker bay, is located at ground floor level and will be demolished using shears mounted on demolition excavators and secondary processing by hot cutting.

4.3 Construction Phase Activities

4.3.1 Construction Schedule

Construction of the proposed development is expected to take ca. 21 months from September 2024, subject to grant of planning permission.

During this period, the three existing generating units will be undergoing maintenance overhauls. One unit will switch to firing HFO followed by the other two units as stocks of coal are reduced. This means that that the plant can operate using HFO almost immediately subsequent to planning permission being granted, and at the request of EirGrid.

As noted previously, a contractor compound and laydown area and associated welfare facilities are long established on the Moneypoint Generating Station site complex. It is proposed to utilise these facilities for the proposed development. As such, no preconstruction or site mobilising works are anticipated prior to commencement of the construction works.

It is anticipated that the construction works will be undertaken in one phase and each element of the works will be constructed sequentially. An indicative schedule is set out in Table 4.1.

Table 4.1: Indicative Construction Programme

Months	Construction Activities
21 Months	Electrical Aux Boiler followed by Distillate Aux Boiler
Months 1 to 21	● Auxiliary boiler building and enabling works ● Equipment installation (M&E construction) ● Commissioning
13 Months	ASA Injection and Batching Plant
Months 7 to 19	● Absorber and batching civil construction (equipment supply) ● Absorber and batching M&E construction (site erection) ● Commissioning
19 Months	HFO Tanks Construction
Months 3 to 21	● HFO tanks construction ● HFO bund construction – Base and floor – Bund walls and ramp

It is proposed to dismantle and remove the stacker reclaimers and metal steelwork within the coal yard and rising conveyors 13A and 13B to ground level, once all coal stocks have been exhausted. These are largely metal structures and dismantling will be by controlled dismantling only. It is envisaged that a separate contract will be required to undertake this element of the works. The dismantling process is expected to take four months and these works will not coincide with the construction works.

4.3.2 Construction Access

All construction traffic will arrive via the N67 national road via the same entrance to the operation site. Heavy Goods Vehicles (HGVs) from outside the local area will be required to access the N67 via the N68 and the M18. Smaller vehicles including Light Goods Vehicles (LGVs) and cars will be permitted to use more local roads to travel to and from the construction site.

4.3.3 Construction Personnel

It is expected that construction personnel will peak at ca. 100 persons. It has been assumed that construction personnel will travel to site using van/minibus or private passenger vehicle (in some cases accommodating more than one occupant). It is noted that the facility is already securely fenced, and access controlled. The proposed development is within the Moneypoint station complex which is controlled by a security team at a security entrance via the N67 Road. The facility security arrangements and access control are not proposed to change as a result of the proposed development.

4.3.4 Hours of Work

Construction works will for the most part take place within normal business hours, 07:00-19:00 Monday to Friday, and 08:00-14:00 on Saturday. However, given the urgent need for this project for security of electricity supply there will be a need to undertake some works outside of these times including concrete pours, floating, works inspections and possibly other work. Construction and dismantling works outside the abovementioned construction hours will only be undertaken with prior written approval of the local authority.

4.3.5 Construction Traffic

Full details on the estimated construction traffic plant movements for each phase of the proposed development are discussed in Chapter 15.

From experience on other projects, peak HGV traffic movements are likely during the material moving operations associated with the site preparation stage of the construction programme. This is applicable to the proposed development as the HFO tank base and auxiliary boiler works will overlap, generating peak HGV traffic in Q1 2025. The daily average is calculated as a maximum of 8no. HGV (resulting in 16no. daily movements) in any given year. During the peak construction period a maximum of 17no. HGVs serving the site (resulting in 33no. two-way movements) has been calculated, in any given year, approximately one-two per hour. This results in a peak daily requirement of 70-80 vehicles (approximately 140-160 two-way movements per day). This would mean a requirement for up to 80 temporary car parking spaces in a robust case scenario.

For abnormal loads, haulage will likely take place outside of peak traffic times and the Contractor may be required to arrange a special escort with An Garda Síochána. Appropriate permits for designated haul routes will be sought and agreed with the Local Authorities during the detailed design phase. It is expected that the auxiliary boilers, boiler stack, cranes and possibly parts of the HFO tanks will be assembled off site and potentially delivered as abnormal load during the construction phase. However, preference will be for oversized loads to arrive via ship, but the exact load sizes and delivery methods will not be known until construction tender stage is complete. A worst-case assumption is considered in Chapter 15 Traffic and Transport; whereby oversized loads will arrive to site via the existing road network.

The appointed Contractor will implement and develop the construction Traffic Management Plan (TMP) included in the CEMP (Appendix C of this EIAR), in ongoing consultation with Clare County Council. The TMP will remain a ‘live’ document which will be implemented as a minimum as discussed in Section 4.3.9.

4.3.6 Temporary Construction Compounds/Laydown Areas

The construction phase will necessitate the provision of a temporary contractor’s compound along with welfare facilities. The temporary contractor’s compound is located along the western boundary within the existing operational compound, as mentioned in Section 4.3.1.

Existing toilet and washing facilities are located at the established contractor laydown area. Additional toilet and welfare facilities are located across the site, and available for contractors.

Electrical and water connections are available in the Contractor compound for any temporary portacabins etc supplied by the Contractors. The main station canteen is also available to all contractors. Temporary car parking for contractors’ vehicles is provided within the temporary contractor’s compound.

4.3.7 Groundworks

4.3.7.1 Groundworks for the HFO Bund

Prior to any groundworks taking place ESB will ensure that:

- Design shall be in accordance with the principles of the CIRIA Guidance on ‘Containment Systems for the Prevention of Pollution’ (C736F) and take due account of the station’s EPA Industrial Emissions Licence.
- The risk arising from filled pipework and tanks in close proximity to the works will be assessed and appropriately managed.

- Subject to condition assessment, existing concrete slab underneath and adjacent to pipework, valves and pump house will either be broken out or remediated to ensure integrity.
- Excavations and rock-breaking of existing gravel surface and existing sub-grade, if required, will be carried out for the foundations of all structures including the bund wall, tank, floor, new access ramp, etc. and for drainage installations.
- Excavated arisings at surface level will be scraped back and set aside for assessment for reuse. If they cannot be reused, they will be removed from site in line with the relevant Waste Management Regulations.

The final sequencing of the works will be determined by the Contractor but it is anticipated that the construction sequence in the HFO bunds will be broadly as follows:

- Clean fill material will be imported and compacted to the required design level.
- A liner material will be laid in accordance with the detailed bund design and manufacturer's requirements together with the installation of the sub-surface drainage system.
- Steel reinforcement will be placed along with form work and associated components for liquid-tight joints in accordance with detailed design.
- The foundations of all structures including the bund wall, tank, floor, new access ramp, etc., will be poured in sections, to be determined by detailed design and the construction methodology.
- The concrete will be required to cure for a period (dependent on detailed design and construction methodology).
- The installation of the land drainage network and the permeable fill surround (located adjacent to the outside of the perimeter wall) will take place in concert with the construction of the bund walls.
- Works on the bund wall, tank, pipework and associated above ground supporting structures and infrastructure will be completed.

4.3.7.2 Groundworks for the Boiler House, Ash Injection Plant and Capping Material Batching Plant

The final sequencing of the works will be determined by the Contractor but it is anticipated that the construction sequence will be broadly as follows:

- Excavations and rock-breaking of existing concrete or gravel surfacing and existing sub-grade, if required, will be carried out for the foundations of all structures.
- Excavated arisings at surface level will be scraped back and set aside for assessment for reuse. If excavated material cannot be reused it will be removed from site along with any demolition waste in line with the relevant Waste Management Regulations.
- Installation of new underground services.
- Clean fill material and blinding will be imported and compacted to the required design level.
- Steel reinforcement will be placed along with formwork in accordance with detailed design.
- Concrete for the foundations of all structures will be poured.
- Works on ground bearing slabs and the above ground structures and infrastructure will be completed in accordance with the Contractors sequencing and methodology.

4.3.8 Plant Construction Works

The Main Contractor will be responsible to ESB for the design and installation of the proposed development. This will include the design, supply, and installation of all equipment and the installation of all equipment foundations.

Most of the new equipment will be skid mounted or containerised elements fabricated off site and delivered finished or for final assembly on site. The main exception to this is the Auxiliary Boiler Building and pipe and cable corridor which will contain the plant pipework (HFO, fire water etc) and cables (power cables, control cables etc) which will have to be fabricated on site. The delivery of abnormal loads on site is discussed in Section 4.3.5.

The Contractor will be responsible to ESB for the construction of the equipment foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main equipment foundations and any piled foundations needed. The Contractor will manage the excavation of material and the safe disposal of this material to a suitably licenced waste disposal facility. In-situ concrete casting will be fully controlled to ensure that cement bound materials are confined within the formwork.

In-situ concrete casting will be fully controlled to ensure that cement bound materials are confined within the formwork.

In the areas where the HFO bunds and Auxiliary boiler house and stack are to be installed, the existing surface water network will need to be modified and re-routed. Surface water drains will also be re-routed and/or sealed in advance of any concrete being cast.

Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution. A designated area for concrete truck / shute washout will be provided on site comprising a lined bund to contain wash out. Concrete waste will be removed at regular intervals (every 2-3 days) and reused on site or disposed off-site with other construction waste materials.

As described above the maximum proposed excavation will not exceed a depth of 1.5m for the foundations for auxiliary boiler house. The maximum proposed excavation depth for the HFO bunds is 400mm. If piled foundations are required, it is envisaged that these would require a similar depth of below ground excavation.

4.3.9 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) is included as Appendix C to this EIAR and will be implemented during the construction phase in consultation with Clare County Council. The CEMP will remain a ‘live’ document which will be implemented as a minimum. It will be reviewed and revised as necessary in consultation and agreement with the local authority to ensure that the measures implemented are effective. The CEMP will be a key contract document, which will ensure that all mitigation measures are implemented.

The primary objective of the CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a project framework to ensure that key mitigation measures and conditions set out as part of the planning consent process are translated into measurable actions and are appropriately implemented during the construction phase of the proposed development. As part of this framework, transparent and effective monitoring of the receiving environment during construction will be used to inform and manage on-going activities on site and to demonstrate effectiveness of the measures outlined therein. ESB will monitor the contractor(s) performance on a regular basis and will undertake various compliance checks throughout the duration of the construction period including:

- Review contractor documents against the requirements of the CEMP
- Undertake regular audits
- Continuously check records
- Set up a contractor reporting structure
- Conduct regular meetings (at least fortnightly) where Environmental Health and Safety is an agenda item.

The CEMP will be required to take account of all relevant legislation in reducing the environmental impacts of the works and best practice guidance such as:

- CIRIA C741 Environmental Good Practice on Site (4th edition) (CIRIA, 2015)
- CIRIA C532 Control of Water Pollution from Construction Sites (CIRIA, 2001)

In general, disturbance arising from construction works may result from various activities including preparatory works, diversion of services, noise and vibration from the plant, excavation and fill operations, stockpiling and handling, construction traffic and the duration and timing of the construction phase. Details of the predicted impacts and mitigation measures associated with the construction of the proposed development are included within the relevant chapters. Monitoring requirements are outlined within each of the topic chapters (6 to 17) within this report.

4.3.9.1 Resource and Waste Management Plan (RWMP)

Prior to commencement of the development, the appointed Contractor will implement the construction Resource and Waste Management Plan (included as part of the CEMP comprising Appendix C of this EIAR) which will ensure that optimum levels of waste prevention, reduction, reuse, recycling, and recovery are achieved throughout the duration of the proposed development. The RWMP will remain a 'live' document which will be implemented as a minimum. The RWMP will be reviewed and revised as necessary in consultation and agreement with the local authority to ensure that the measures implemented are effective.

The RWMP has been prepared in accordance with waste management guidance and principles as outlined in *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects* (EPA, 2021) and 'Design Out Waste: A design team guide to waste reduction in construction and demolition projects' (EPA, 2015). All operations at the site will be managed and programmed in such a manner as to prevent/minimise waste production and maximise upper tier waste management (i.e. reuse, recycle, and recovery) in line with the Waste Hierarchy where possible.

The requirement to develop, maintain and operate the construction phase RWMP will form part of the contract documents for the proposed development and will be updated by the appointed Contractor in advance of the commencement of construction activities on site.

Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in a manner which will not adversely affect the environment. All employees will be required to comply with the obligations under the Plan. The RWMP will be available for inspection at the site office at all reasonable times for examination by the Consenting Authority. Waste management is discussed further in Chapter 16.

4.3.9.2 Traffic Management Plan

The appointed Contractor will implement and develop the construction Traffic Management Plan (TMP) included in the CEMP (Appendix C of this EIAR), in ongoing consultation with Clare County Council. The TMP will remain a 'live' document which will be implemented as a minimum. The TMP will be reviewed and revised as necessary in consultation and agreement with the local authority to ensure that the measures implemented are effective. The implementation of the TMP will mitigate potential construction traffic impacts on the public road network. All construction activities, including construction traffic, will be managed through the CEMP.

The TMP will ensure that potential impacts resulting from construction traffic on the local community, businesses and other industry adjacent to the site, are minimised. The Contractor will be required to develop their construction Traffic Management Plan to suit the access and egress of the site, their delivery and laydown requirements, expected movements of construction traffic, the size of the Contractor's compound along with their programme of works.

Specific haul routes, details of any oversized loads (if required) and a Traffic Management Plan will be prepared in advance of construction. This TMP will be agreed with Clare County Council, if required.

4.3.10 Environmental Supervision and Monitoring

An Environmental Clerk of Works (EnCoW) will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The Contractor's Environmental Clerk of Works (EnCoW) will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The EnCoW will be delegated sufficient powers under the construction contract so that she / he will be permitted to instruct the Contractor to stop works and apply emergency response mitigation should an environmental incident occur.

The EnCoW will also manage consultation with environmental bodies including the NPWS and IFI. The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

An independent EnCoW will be retained on behalf of the Employers Representative team (i.e. the ESBN), who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's EnCoW. The independent EnCoW will have the necessary experience and knowledge appropriate to the role and will be a member of a relevant professional body, such as the Institute of Environmental Management and Assessment (IEMA).

In addition to the above, the CEMP includes an Environment Incident Response Plan (Section 5 of the CEMP). In the unlikely event of an incident, the Environmental Incident Response Plan will ensure that any incident is dealt will effectively, and that the response is timely and appropriate. This plan will be further developed by the appointed Contractor, in line with the mitigation measures detailed in the CEMP, to describe the procedures, lines of authority and processes that will be followed to ensure that all incident response efforts are prompt, efficient and appropriate to the particular incident. Inland Fisheries Ireland and the EPA will be notified in the event of an incident or accident.

The Contractor will be responsible to ESB for the construction of the equipment foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main equipment foundations and any piled foundations needed. The

Contractor will manage the excavation of material and the safe disposal of this material to a suitably licenced waste disposal facility. In-situ concrete casting will be fully controlled to ensure that cement bound materials are confined within the formwork.

4.4 Operation and Maintenance

4.4.1 Proposed Operational Profile

This section sets out a summary of the expected operational profile of the Moneypoint Generating Station once the operation is switched to security of supply rather than base load operation. It is important to note that EirGrid will ultimately have control over how and when Moneypoint operates and that controls are automated.

4.4.1.1 Auxiliary Boiler Operation

During the winter months, one of the auxiliary boilers will be left in the standby state i.e. it will maintain a minimum temperature and pressure automatically. Preference will be given to using the electrical boiler for this purpose but if electricity demand is high the diesel boiler will need to be used. When steam is required for HFO tank heating, deaerator or generating unit start the auxiliary boiler will fire up/turn on automatically and provide steam as required.

If there is no demand for heat or forecasted unit running the auxiliary boiler main outlet valve will be closed to preserve pressure. The auxiliary boiler setpoint will also be turned down, similar to turning down a thermostat on a domestic boiler. This will reduce the periodic start requirements and energy demand.

The second auxiliary boiler will either be stored dry or left in the ready state (filled with water). It will either be left cold or at a lower standby temperature and pressure depending on the projected electricity demand and renewable energy forecasts.

During the summer months, one boiler will likely be drained down and stored dry, the second boiler may be started weekly, depending on weather, to keep the HFO tanks and deaerator warm. During summer the temperature and pressure in the auxiliary boiler will not be maintained between operation cycles.

4.4.1.2 Main Unit Start

The following steps are roughly what will occur to start a main generating unit at Moneypoint when no generating units are running.

- Station receives command to start single unit through EirGrid's automated electronic dispatch system EDIL (Electronic Dispatch Instructions Logger).
- Regarding the Auxiliary Boilers, the operator either:
  - Does nothing, if the first auxiliary boiler is the standby state and aux pressure setpoint is already at the appropriate pressure.
  - Changes the auxiliary pressure setting and open the auxiliary steam outlet valve to start as set out in Section 4.4.1.1.
- The operator follows either the Hot, Warm or Cold start procedure for the generating unit dispatched.
- The operator may then decide to move the second aux boiler into standby state to provide redundancy.
- Once the main generating boiler unit is synchronised the first auxiliary boiler pressure will be reduced and will provide backup to the unitised auxiliary steam system. The second auxiliary boiler will be either shut down or turned down to minimum temperature and pressure.

4.4.1.3 Second and Third Unit Start

The following steps are roughly what will occur to start a second main generating unit at Moneypoint when one generating unit is already running.

- Station receives a command through the EDIL system once one unit is already synchronised to start a second generating unit.
  - Pressure in the first auxiliary boiler will be increased to provide steam as required to support the second unit startup, or
  - The first unit will be used for auxiliary steam supply and the aux boiler will act as backup only.

4.4.1.4 Start Two or Three Units Together

The following steps are roughly what will occur when a command from EirGrid is received to start two or three generating units when no units are already running.

- Station receives a command through the EDI system to start two or more units when none are a currently running.
  - Second auxiliary boiler will be started.
  - The first auxiliary boiler setpoint will ramp up to temperature and pressure to provide steam for the first unit and subsequent units starts up its maximum capacity.
  - The second aux boiler will then ramp up to meet any additional load requirements.
  - The operator initiates the first Unit start as per Hot, Warm and Cold Start sequence procedures.
  - The second and third units will be started as instructed by EirGrid.
  - When two or more units are running at stable load, both auxiliary boilers will be shutdown with valves closed to maintain heat, one may be left in a standby state with pressure set to medium or low range.
- In a hot start scenario, the main generating boilers will be full and have some temperature and pressure retained. There may be some but limited requirement for supplementary auxiliary steam in this case. One auxiliary boiler will be left in a ready state to provide redundancy to the main unit auxiliary steam system.
- For a cold start there will be up to an eight hour delay between subsequent second and third unit starts. This will ensure that the second auxiliary boiler has sufficient time to get up to temperature and pressure.

4.4.2 Ash Reclamation and Storage

The process of recovery of ash and FGD injection and capping of the ASA repository when firing on HFO alone is set out in Section 4.2.5.

4.4.3 Working Hours

The proposed development will be available to operate 24-hours per day, seven days per week and will operate as an out of market generator of last resort only.

4.4.4 Operational Staff

4.4.4.1 Existing Staff Numbers

There are approximately 130 Full Time Equivalent (FTE) personnel working on site on a daily basis. This consists of ESB staff and contractors.

All work is as business needs require. During outages and overhauls contractor numbers increase with the workload up to 250 additional resources.

4.4.4.2 Proposed Staff Numbers

Staffing numbers are to remain as business needs require. Post 2025, following the completion of the last major overhaul, the change in contractor numbers for outages will not be discernible for the numbers currently employed on site.

4.4.5 Operational Site Access and Security

The facility is already securely fenced and access controlled. The proposed development is within the Moneypoint station complex which is controlled by a security team at a security entrance via the N67 Road. The facility security arrangements and access control are not proposed to change as a result of the proposed development.

4.4.6 Drainage and Wastewater Management

4.4.6.1 Surface Water Drainage

Overall flow at IEL SW2 location (location is shown in Figure 11.2 will be limited such that the overall discharge will not exceed the existing IEL flow limits of 25m^3/hour or 400m^3/day. In addition to this, the current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2 will continue to be complied with (pH, mineral oil, suspended solids, and ammonia (as N)).

In addition to the measures set out in Section 4.2.6, drainage on site will continue to be managed in accordance with the conditions of the site's IE licence including but not limited to the following:

- Prevention of "environmentally polluting substance or matter" entering surface water or storm waters
- Weekly visual inspections
- Maintenance as required
- Monitoring of discharges from SW2
- Emission limit values set on SW2
- Reporting to the EPA

4.4.6.2 Foul Water

There are no changes to the management of foul water at the site as part of this proposed development. A foul water service is not needed for the proposed development.

4.4.6.3 Water Treatment Wastewater

Demineralised water is produced at Moneypoint's water treatment plant for steam production. Raw water is supplied from local mains and stored at the onsite reservoir. The raw water's positive and negatively charged ions are removed by cation and anion exchange resins. The demineralised water is stored in the raw feed water tank and then dispersed to smaller holding tanks for each unit.

The resins are regenerated with either sulphuric acid or sodium hydroxide to ensure effective removal of ions. The water used in the regeneration process is stored in the neutralisation sump where the pH is balanced by acid or caustic injection as required. This water is either discharged through SW7 or diverted to the industrial water tank for flue gas temperature control in the FGD.

There are no proposed increases to water treatment arrangements, as per the IEL, or additional water demand as part of this proposed development.

4.4.6.4 Process Wastewater

The only proposed change to process water on site will be boiler blowdown from the proposed auxiliary boiler house as described in Section 4.3.8. It is proposed to connect this process water to the existing system which discharges to the Shannon Estuary at IEL emission point SW2 or diverted to the industrial water recovery tank for flue gas temperature control in the FGD. The current process water discharge monitoring requirements and ELVs associated with discharge at SW2 will continue to be complied with (pH, mineral oil, suspended solids, and ammonia (as N)).

Discharges on site will continue to be managed in accordance with the conditions of the site's IE licence, some of the related measures are listed under Section 4.4.6.1 and are equally applicable to all discharges from SW2.

4.4.7 Lighting

Currently tank farm only has localised lighting for each tank farm stairwell and localised at the entrance of the pumping house to the northern entry point. It is proposed that the lighting will comply with the Recommended Lighting Practices published by the Permian Basin Petroleum Association, the Texas Oil and Gas Association, the American Petroleum Institute, University Lands, and the McDonald Observatory[5]. This includes:

- Use of full cut-off luminaires
- Directing of lighting to eliminate light spill and trespassing
- Amber lighting
- Control of lighting so as not to exceed the minimum number, intensity and coverage required for safety and basic security
- Area lighting to be controlled by timers, sensors or switches available to operators
- Focused task lighting, portable light towers, or flashlights to be used instead of area lighting, where feasible

The proposed development will not be lit permanently as there is no requirement for the site to be permanently occupied. Lighting will be provided when personnel are on site to assist any night-time maintenance visits comprising lighting from the car park to the control room and other building entrances.

External lighting will be automatic with motion detection and will be linked back to a security system if activated. There will be an option to override the control to turn on/off the system remotely or within the compound. Lighting will consist of LED luminaires due to their sharp cut-off, lower intensity and good colour rendition. A warm white spectrum will be adopted to reduce blue light component. Only luminaires with an upward light ratio of 0% and with good optical control will be used and there should be no upward tilt.

Lighting requirements for the HFO development are proposed as follows, with lux values to be assumed at ground level:

- Light poles 'LP': Min 10 lux at ground level
- Spot lights will be installed to the eves heights of main buildings, HV switchgear, transformer and maintenance areas – Min 20 lux at ground level

[5] Recommended Lighting Practices (Permian Basin Petroleum Association, Texas Oil and Gas Association, American Petroleum Institute, University Lands, and McDonald Observatory)

- Everywhere else on development: Min 2 lux at ground level
- Outside development fences: Existing lighting in Moneypoint station complex

The proposed light poles are presented in the site plans and detailed in Planning Drawing QP-000017-65-D451-018-001-000 submitted with this application.

4.4.8 Fuel Deliveries

HFO is currently delivered to site by ship to the HFO unloading arm on the jetty and pumped to the existing HFO tanks via a pipeline. This is the existing arrangement and is not proposed to change. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. However, HFO ships are generally much smaller with an average payload of ca. 27,000 tonnes, or just over one full tank. This compares with an average ship payload of ca.180,000 tonnes for a coal ship. The existing jetty is designed to cater for ships with a payload of up to 200,000 tonnes. It takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship.

There will be on average ca. 40 diesel deliveries via road to Moneypoint Generating Station per year.

A “procedure for unloading oil ships”, shore side check list for ship unloading and “Oil Spill Response Plan” is in place on site which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills. There is also a spill containment area to capture any spills that might occur at the unloading arm.

It is important to note that shipping of HFO and coal to the Moneypoint site are part of the existing operations. There is a history of HFO shipping in the estuary; HFO has been shipped to Tarbert since 1969 and Moneypoint since the early 1980s. To our knowledge there has never been a major HFO spill that resulted in significant ecological impact within the Shannon estuary.

HFOs are dense, viscous oils. The TLUP (Appendix D of this EIAR) includes the physico-chemical properties of the HFO and states that its water solubility is “negligible, predominantly hydrophobic”. The TLUP also states that HFO is considered to be very toxic to aquatic life with long lasting effects. However, due to the low water solubility of their chemical constituents, the toxicity of HFO to aquatic organisms is expected to be lower than that of other petroleum products including diesel (National Oceanic and Atmospheric Administration, 2019)[6]. The TLUP also states that the pour point (the temperature below which the oil becomes a semi-solid and will not flow) for HFOs is often 30ºC or higher, and therefore many HFOs will act as viscous semi-solids after being spilled and cooled at ambient temperatures.

It should also be noted that the last remaining operational HFO fuelled electricity generating unit at Tarbert Generating Station (TB3), located across the estuary at Tarbert, Co. Kerry and operated by SSE Airtricity, officially closed in December 2023. Units TB1, TB2 and TB4 ceased normal operation during 2021 and officially closed in December 2023[7]. It is estimated that around 540,000 tonnes HFO per year would have been consumed at Tarbert when the plant was fully operational as a mid-merit plant. This would equate to ca.14 HFO ship deliveries at 40,000 tonnes each. A representative of Tarbert confirmed that HFO deliveries to the site, when it was fully operational, averaged ca.12 to 14 per year and that ships of 35,000 - 40,000 tonnes were the more common ship sizes. These HFO deliveries in the estuary to Tarbert have therefore have now ceased with no proposal for them to recommence in the short to medium term, reducing the traffic of HFO tanker ships in the estuary, as shown in Table 4.2 which provides a context of coal and HFO ship movement in the estuary.

[6] Heave Fuel Oil Spills (NOAA, 2019)

[7] Ten-Year Generation Capacity Statement 2023–2032 (EirGrid, SONI, 2024)

Table 4.2: Coal and HFO Ships in the Shannon Estuary

	Baseline Annual Ships	Proposed Future Annual Ships
Coal Ships To Moneypoint (average 180,000 tonnes)	15 (2021)	0
HFO Ships To Moneypoint (ca. 24,000-35,000 tonnes)	9 (2021)	24
HFO Ships to Tarbert Generating Station (ca.35,000-40,000 tonnes)	12 - 14	0
Cumulative Ships Total	**36 - 38**	**24**
Cumulative HFO Ships*	**21-23**	**24**

* It should be noted that HFO may be transported in the estuary to other sites.

Source: ESB, 2024

In conclusion, Table 4.2 shows that the increase in HFO shipping in the estuary as a result of the proposed development in combination with the closure of the Tarbert HFO fired Generating Station will likely be only one ship annually.

Additionally, all vessels as required by law governed by the provisions of the Sea Pollution Act 1991, as amended, will be compliant with the International Convention for the Prevention of Pollution from Ships (MARPOL) with specific attention to Regulations 37 and 17 and will adhere to published guidelines and best working practices such as the National Maritime Oil/HNS Spill Contingency Plan (NMOSCP)[8]. These contain the necessary steps to initiate an external response for any oil-related discharges, or in the case of a maritime accident/collision that results in an oil spill and will be adhered to, to ensure that the likelihood of accidental spills is extremely low. In addition, all substances handled and/or used required to be handled, used, stored and documented in accordance with assessments and the Chemicals Act 2008 (No. 13 of 2008) and Chemicals (Amendment) Act 2010 (No. 32 of 2010) and associated Regulations.

All vessels will also be fit for purpose, certified and capable of safely undertaking the required work. Vessels shall have a Health, Safety and Environmental Managements system which should conform to the requirements of the latest International Maritime Organization (IMO), Safety of Life at Sea (SOLAS) and environmental requirements for their classification and with any national requirement of the territorial or continental/EEZ (Exclusive Economic Zone) waters to be operated in.

4.4.9 Industrial Emission Licence

The proposed development is located within the boundary of an existing Industrial Emissions (IE) licenced facility: the Moneypoint Generating Station (Register Number: P0605-04), regulated by the EPA.

It is not proposed to change any of the existing emission limit values in the IE licence. The proposed development will require an update to the existing IE licence from the EPA namely to add the proposed auxiliary boiler stack as an emission point. Ultimately the EPA is the competent authority in relation to the IE licence, emissions, and environmental management.

ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to include the proposed development under the IE licence. Public notification was issued in the Irish Times on the 8 January 2024 (as discussed in Section 1.7).

[8] National Maritime Oil/HNS Spill Contingency Plan (NMOSCP) (Department of Transport, 2020)

4.4.10 Chemical Storage

A schedule of existing chemical storage on site is included in Table 4.3, no changes are proposed to this schedule.

Table 4.3: Schedule of Existing Chemical Storage on Site

Chemical	No of Tanks	Storage (Tonnes)	Total (Tonnes)
Sulphuric acid (98%)	2	60	120
Sodium hydroxide (47%)	2	60	120
Ammonia (30%)	1	45	45
Bulk Hydrazine (5%)	2	3	6
Hydrochloric acid (7%)	1	1	1
Urea dissolved (40%)	2	1250	2500
Calcium Oxide	2	9000	18000
Calcium Hydroxide	3	60	180
Hydrochloric acid (conc.)	1	2.2	2.2
Hydrazine	1	1	1
Ammonia (dilute)	3	2	6
Ammonia (conc.)	1	1.6	1.6
Hydrazine (dilute)	1	1	1

Source: ESB IEL, 2023

A schedule of existing hydrocarbons storage on site is included in Table 4.4. The two proposed HFO tanks, each with a capacity of 25,000 tonne, will add to the hydrocarbons storage on site.

Table 4.4: Schedule of Existing Hydrocarbons Storage on Site

Oil	Capacity	Comments
Heavy Fuel Oil Storage		
HFO Tank 1	25,000t	Bunded
HFO Tank 2	25,000t	Bunded
Diesel Storage		
Diesel for boilers. Installed 1984.	2 x 300 t	Bunded
White Diesel for vehicles:	24.56 m^3	Bunded
Green Diesel for Vehicles	83 T tank and 14.7 m^3	Bunded
Bio-Diesel	1x 2000 lt	Bunded
Various Lube Products	53750 L	Dedicated Stores
Diesel	11001	Bunded
Various Oils	10 off 45 gl	Drip Tray Drum
Unit Oil Tanks		
Turbine Lube Oil Tank	24.4 m^3	Bunded
Boiler Feed Pump	2 x 3.5 m^3	Bunded
HP Hydraulic Fluid Tank	0.6 m^3	Bunded
Lube Oil Stores		
65 various grades of lube oil and other lube products held in the dedicated stores at Moneypoint	Maximum potential inventory on-site is 53,570 L	
Waste Oil Storage		
Waste Oil - Drums and Underground Sump		Decommissioned

Oil	Capacity	Comments
Waste Oil - Emergency Waste Oil Tank	4000 Gals	Bunded
Solvent		Decommissioned
Waste Oil - Mobile Plant Maintenance	1.4 m^3	Bunded
Waste Oil - Waste oil Container Area	Drums	Bunded Plinth
Solvents - Waste Solvents Area	Drums	Bunded Plinth

Source: ESB IEL, 2023

A schedule of existing gas storage on site is included in Table 4.5, no changes are proposed to this schedule.

Table 4.5: Schedule of Existing Gas Storage on Site

Description	Capacity	Comments
LPG - Calor Gas. This is used to ignite the boilers	68 m^3	Fenced
Hydrogen - is stored in bottles mounted on Trailers	2x ca. 260kg per trailer	Fenced Compound
Carbon dioxide - used for purging hydrogen (20 spare bottles in gas storage compound)	24 bottles per unit	
SF6	0.537 m^3	Hermitically sealed in various switchgear and electrical components on site

Source: ESB IEL, 2023

All chemicals stored on the proposed development will be regulated under the IE licence.

All fuels and chemicals stored on site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH:

- All containers and bunds will be inspected regularly;
- Accidental spillages will be contained and cleaned immediately;
- Any environmental incidents, including spills, will be reported to the EPA and other relevant competent authorities;
- All chemical storage areas to have adequate supply of spill kit(s). Once used, the absorbent material to be disposed of at an appropriate facility (Condition 3.8). All potentially polluting substances including waste will be stored in designated areas in appropriate containers within bunds, drip trays or spill pallets, as required.
- All personnel handling chemicals and fuels to ensure awareness and competence in their work area (Condition 2.2.2.12).
- Potentially polluting substances stored in designated areas to be labelled clearly (Condition 3.7.5).
- All storage tanks, containers, and drum storage areas that contain liquid material other than water, to have leak detection system in place (Condition 3.77).
- The loading and unloading of materials to be carried out in designated areas protected against spillage and leachate run-off (Condition 8.5).
- Waste and materials shall be stored in designated areas, protected as may be appropriate against spillage and leachate run-off (Condition 8.6).

All tanks containing liquids whose spillage could be harmful to the environment will be bunded. No tanks or pipework containing liquids such as fuel, oils or chemicals will be stored below ground.

4.5 Decommissioning

The proposed development is expected to be operational until the end of 2029. On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and IE licence, unless otherwise authorised.

A Decommissioning Management Plan (DMP) and Closure, Restoration and Aftercare Management Plan (CRAMP) has been submitted to and agreed with the EPA in accordance with condition 10 of the IEL. The DMP and CRAMP state that "*Successful decommissioning is determined as being completed when all buildings, equipment, wastes or any other materials that could result in environmental pollution are removed from the site and recycled, recovered or disposed of in accordance with all regulations in force at that time. The DMP will result in a decommissioned site suitable for future industrial use. All buildings and some site services, whilst emptied and cleaned as part of the DMP, will remain in place following decommissioning*."

All chemicals and oils will be stored in bunded areas.

The DMP and CRAMP will be updated to include the proposed development for agreement with the EPA once construction is substantially complete.

On decommissioning some of the structures on site may be used for future developments such as those which may be linked to the Green Atlantic @ Moneypoint project which is in the early design and feasibility study stages.

4.6 Health and Safety Considerations

4.6.1 Firefighting Systems and Controls

A fire at the HFO tanks is considered very unlikely as HFO has a relatively high flash point of >70C. Refer to the Land Use Planning Report (Appendix D) submitted with the application for details on fire and other safety risks.

In the event of a fire, firefighting on site would be predominately carried out by manual fire suppression using the existing fire water hydrant network on site. The existing fire water network on the site may be used for the protection of the equipment that is proposed to be installed as required by the local fire authority. Fire safety evacuation drills and training will be provided as appropriate. National Fire Protection Association (NFPA) guidance will be followed as appropriate. An "Emergency Procedure in the Event of Fire" is in place in relation to HFO storage and handling and was prepared in consultation with the local Fire Services. All these measures are already in place at Moneypoint Generating Station and will be incorporated for the proposed development.

The station's existing fire protection system comprises a hydrant main and deluge system. The ring main is equipped with facilities for the use of both foam and high-pressure water systems. There is a total of 36,368 m^3 (8 million gallons) of firewater stored in three reservoirs to the north of the site, adjacent to the HFO tanks. The associated Pump House is located adjacent to the Water Treatment Plant to the south of the reservoirs. There are two electric pumps and one diesel pump, each with a capacity of 2.3m^3/min at 8.3 bar pressure. Automatic and manual operated high-pressure deluge systems protect the areas of the plant most at risk. There are no proposed changes to this system.

The current firefighting strategy for the HFO tanks is to fight the fire for ca. 30-90 min. If the fire cannot be extinguished in this time a controlled burn strategy would be adopted. It is not proposed to change this strategy.

In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with Condition 3 and Condition 6 of the IE licence and in agreement with the EPA and other relevant authorities.

5 EIAR Methodology

5.1 Introduction

Environmental Impact Assessment (EIA) Directive 2011/92/EU on the assessment of the effects of certain public and private projects as amended by Directive 2014/52/EU (hereafter termed 'the amended EIA Directive') defines EIA as a process consisting of:

1. The preparation of an Environmental Impact Assessment Report (EIAR) by the developer;
2. The carrying out of consultations;
3. The examination by the competent authority of the EIAR, any supplementary information provided by the developer (where necessary) and relevant information received through consultations with the public, prescribed bodies and any affected Member States;
4. The reasoned conclusion of the competent authority on the significant effects of the project on the environment; and
5. The integration of the competent authority's reasoned conclusion into any development consent decision.

This definition provides for a clear distinction between the process of EIA to be carried out by the competent authority and the preparation by the developer of an EIAR.

The EPA Guidelines 2022 describe the EIAR as follows:

"The EIAR consists of a systematic analysis and assessment of the potential effects of a proposed project on the receiving environment. …The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign".

This chapter sets out the approach to this EIAR. For each assessment, a precautionary approach[9] has been applied whereby maximum design parameters based on realistic worst-case dimensions, orientations and components have been assessed. This approach ensures that the assessment will consider the greatest environmental impact (i.e. largest footprint, longest exposure, or highest dimensions depending on the topic). This approach is a resilient method where it may not be possible to identify the exact design parameters at this stage within the final design, thereby accommodating flexibility in design and construction whilst ensuring maximum extents and ranges are assessed in this EIAR.

The technical chapters of this EIAR provide further topic specific details of the methodologies applied in the preparation of this EIAR.

5.2 EIA Directive

The amended EIA Directive requires that the EIAR provides:

"A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge".

[9] It is important to note that these estimates/ projections are based on tapering run hours of 15,000 hour in 2024 to 9,000 hour in 2026-2029 but ultimately EirGrid will have control on how many run hours the plant is operational for and therefore the amount of FGD material produced.

Article 3(1) states that the EIA shall:

"Identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the project on the following factors:

1. Population and human health;
2. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
3. Land, soil, water and climate;
4. Material assets, cultural heritage and landscape; and
5. The interaction between the factors referred to in points (a) to (d)".

Article 5 states that an EIAR shall include at least:

1. "A description of the project comprising information of the site, design, size and other relevant features of the project;
2. A description of the likely significant effects of the project on the environment;
3. A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce, and if possible, offset likely significant adverse effects on the environment;
4. A description of the reasonable alternatives studied by the developer which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;
5. A non-technical summary of the information referred to in (a) to (d); and
6. Any additional information specified in annex iv relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected".

Annex IV requires;

"The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium term and long term permanent and temporary, positive and negative effects of the project. The description should take into account the environmental protection objectives established at Union or member State level which are relevant to the project".

In addition, Annex IV requires:

"A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved".

5.3 EIA Screening

Screening is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

As stated in Section 1.6.4, Annex I to the EIA Directive 2014/52/EU requires as mandatory the preparation of an EIA for all projects listed therein. Projects listed in Annex II to the Directive are not automatically subjected to EIA. Member States can decide to subject them to an assessment on a case-by-case basis or according to thresholds and/or criteria (for example size), location (sensitive ecological areas in particular) and potential impact (surface affected, duration).

In Ireland, Schedule 5 (Part 1 and Part 2) of the P&D Regulations, as amended, transposes Annex I and Annex II to EIA Directive 2014/52/EU.

The following review seeks to determine whether any part of the proposed development constitutes a prescribed class of development listed within Schedule 5, Part 1 or Part 2.

5.3.1 Schedule 5, Part 1

Moneypoint Generating Station is a thermal power station, steam is generated from the burning of coal which activates a turbine and subsequently produces electricity. Each turbine is dual fuel operated and the generating capacity of each turbine will remain unchanged as a result of proposed change from coal to HFO. The fuel type change will require the construction of two auxiliary boilers (c. 22.7MW thermal) to supply steam for start-up and HFO heating. The total electricity capacity of the existing Moneypoint Generating Station is ca.900 MW, with a cumulative heat output greater than 300 MW, which will remain unchanged as a result of proposed change to heavy fuel oil.

The proposed development is considered to constitute a prescribed class of development identified in Part 1 of Schedule 5 of the P&D Regulations, specifically, Paragraph 2(a), which is reproduced below, as it meets the definition of a thermal power station and also exceeds the heat output threshold.

"2 (a) A thermal power station or other combustion installation with a heat output of 300 megawatts or more."

Also relevant, is the storage of the additional volumes of HFO required for electricity generation. The proposed development requires an additional two HFO tanks with a total capacity of 50,000 tonnes, which brings the total volume of on-site HFO storage to 100,000 tonnes. The Moneypoint site also contains two distillate storage tanks, each with a capacity of 300 tonnes; and other smaller volumes of diesel, oil, lubrication oils and waste oils are also stored on site (refer to Table 4.4 of this EIAR). Part 1 Paragraph 21, as reproduced below, is relevant to the proposed development as it relates to the storage of petroleum products. However, the capacity threshold has not been exceeded, and therefore mandatory EIA is not required under this class of development.

"21. Installations for storage of petroleum, petrochemical, or chemical products with a capacity of 200,000 tonnes or more."

The development description listed in Section 4.2 and Section 4.3 does not result in the categorisation under any other prescribed class of development listed in Schedule 5, Part 1.

As the proposed development falls within a prescribed class of development in Part 1 of Schedule 5, an EIA is required.

5.3.2 Schedule 5 Part 2

Within Schedule 5, Part 2 the following prescribed classes of development were considered relevant to the proposed development.

"6. Chemical Industry (development not included in Part 1 of this Schedule)

(d) Storage facilities for petrochemical and chemical products, where such facilities are storage to which the provisions of Articles 9, 11 and 13 of Council Directive 96/82/EC apply."

Although Directive 96/82/EC (Seveso II Directive) is no longer in force, having been repealed and replaced by Seveso III Directive (2012/18/EU), both Seveso Directives set obligations for operators to prevent manage sites where dangerous substances are stored in large quantities. Moneypoint Generating Station is categorised as an 'Upper Tier establishment' under the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances)

Regulations 2015 (which transposes and implements the Seveso III Directive (2012/18/EU)). Although Moneypoint Generating Station is not a chemical industry installation the referenced articles of Seveso II Directive still apply as the Moneypoint site continues to be categorised as an Upper Tier establishment[10] for the storage of petrochemicals - HFO and [petroleum] distillate. This position is in aligned to European Commission guidance[11], which states that Annex II titles are "declaratory titles, with the purpose of logically grouping closely linked projects" however this does not exclude the development class being applicable to another project under a different group heading.

The class of development defined in Paragraph 6(d) describes activities at the Moneypoint site, thus a mandatory EIA is required.

Moneypoint Generating Station operations also require the storage of flue gas desulphurisation by-products, within an on-site ASA. These by-products are considered to be an inert and non-hazardous waste stream and under the current operations at Moneypoint a total of 100,000 tonnes per year is required to be stored within the ASA. It is calculated that the overall storage requirement under the proposed development for the period 2025 to end 2029 will be c. 495,132m^3. These operations require the consideration of the applicability of Paragraph 11 (of Schedule 5, Part 2), which is reproduced herein.

"11. Other projects - Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule."

The proposed development will result in the intake of waste from the combustion process at a volume greater than 25,000 tonnes per annum. Consequently, the development is considered to trigger the requirement for mandatory EIA, as it falls under the description of this class of development and exceeds the stated threshold.

Additionally, the proposed development requires the dismantling of several structures related to the coal handling and several associated buildings, thus Paragraph 14 – Works of Demolition, as reproduced below, has been reviewed for its applicability.

"14. Works of demolition carried out in order to facilitate a project listed in Part 1 or Part 2 of this Schedule where such works would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7."

Class 15, reproduced below, has potential applicability to any development class listed in Part 2.

"15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7."

The proposed development will require the decommissioning and removal of coal handling plant and the dismantling of associated buildings with the removal of structures to ground level. However, these works are not expected to have potential for significant effects on the environment and consequently, the development is not considered to trigger the requirement for mandatory EIA in relation to Class 14 and 15.

[10] Public Information on an upper-tier establishment as required by Regulation 25 (HSA, 2023) (accessed 18 December 2023)

[11] Interpretation of definitions of project categories of annex I and II of the EIA Directive (European Commission, 2015)

5.4 EIA Scoping

Scoping is the process of identifying the significant issues which should be addressed by a particular impact assessment as well as the means or methods of carrying out the assessment. Scoping of an EIAR is voluntary for a developer. While this EIAR has been developed in line with EIA Directive 2014/52/EU, formal scoping of this EIAR has not been undertaken. Informal scoping has been informed by way of consultation with the key stakeholders and undertaking pre application consultations with both Clare County Council and An Bord Pleanála. Further detail is provided in Section 1.7 of this EIAR.

5.5 EIAR Methodology

5.5.1 Regulations and Guidelines

This EIAR has been prepared in line with the Planning and Development Act, 2000 S.I. No. 30/2000, as amended, and associated Regulations having regard to the following guidelines.

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018); and
- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017).

Further specific reference documents are cited within the technical chapters of this EIAR, as appropriate.

5.5.2 Receiving Environment

The baseline environment describes the current state of environmental characteristics, detailing the condition, sensitivity and significance of relevant environmental factors which are likely to be significantly affected by the proposals[12].

The amended EIA Directive also requires consideration of the likely future receiving environment in the absence of the project, refer to Section 3 of this EIAR.

“A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.

5.5.3 Temporal and Spatial Scope

The duration of effects is described for each technical chapter of this EIAR.

Spatial (or geographical) scope refers to the area over which the EIAR considers effects. The environmental sensitivity of the surrounding geographical areas and the establishment of source-pathway-receptor linkages (i.e. the zones of influence) determine the extent of the area assessed as part of this EIAR. This is defined in each of the technical chapters of the EIAR.

[12] It is noted that the baseline environment for proposed development is a fully operational Moneypoint Generating Station operating as baseload on coal.

5.5.4 Identification of Potential Receptors

A receptor is defined in the EPA Guidelines 2022 as *"any element in the environment which is subject to impacts".*

The environmental effect will depend on the spatial relationship between the source and the receptor with some receptors being more sensitive than others to particular environmental effects. Topic specific receptors have been identified in each technical chapter, as appropriate.

5.5.5 Identification of Likely Significant Impacts

Where appropriate and unless otherwise stated, the evaluation of impacts on the environment has been evaluated according to the criteria outlined in Table 5.1 and as referenced in the EPA Guidelines 2022.

The EPA Guidelines 2022 suggest that EIAR should focus on the likely, significant effects. Likely or probable effects are defined as "*those which are planned to take place (e.g. the projected emissions, the proposed earthmoving etc.) and those which can be reasonably foreseen to be inevitable consequences of the normal construction and operation of the project*." Significance of effects is described as "*the importance of the outcome of the effects (the consequences of the change*). Significance is determined by a combination of (objective) scientific and subjective (social) concerns. The professional judgement of competent experts plays an important role in determining likely significant effects."

Table 5.1: Description of Effects

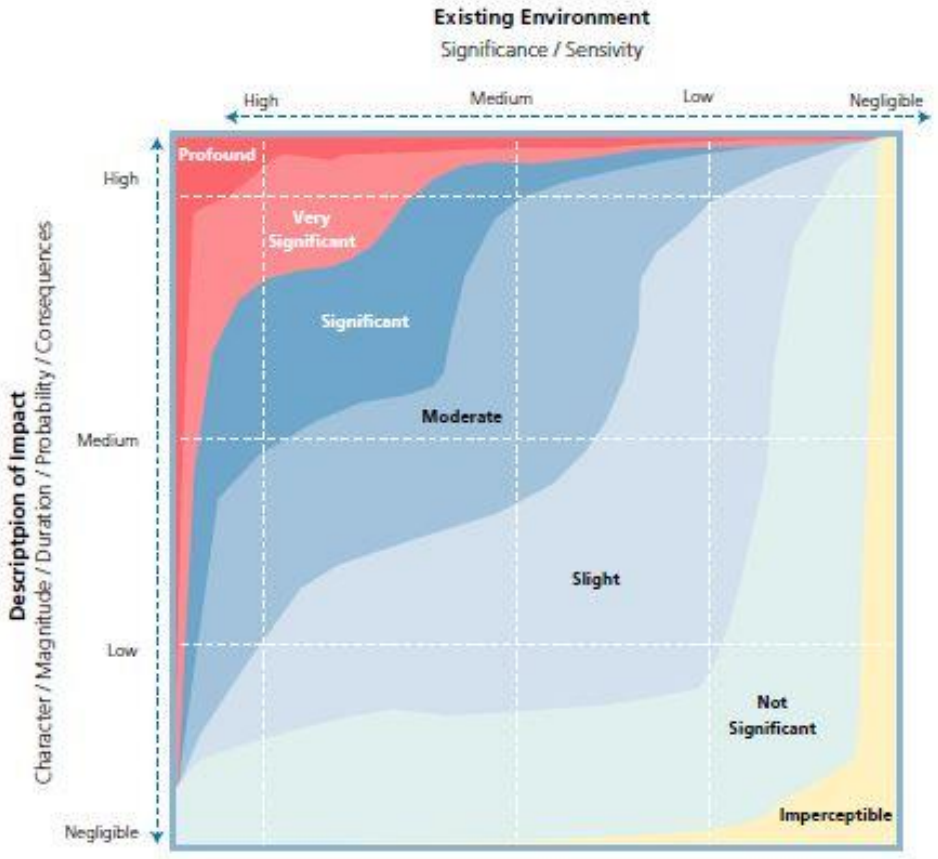
Category	Description of Effects
Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance below.).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects

Category	Description of Effects
	An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years
	Long-term Effects Effects lasting fifteen to sixty years
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary Effects)** Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	`Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.

Category	Description of Effects
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

The significance of a potential impact is defined by the sensitivity of the receiving environment and the character of the predicted impact as shown in Figure 5.1. In some cases, magnitude or significance cannot be quantified with certainty, and in these cases professional judgement remains the most effective way to identify the significance of an impact. Where significant adverse effects are likely, mitigation to offset those impacts is required.

Figure 5.1: Impact Assessment Methodology



Source: EPA Guidelines 2022

5.5.6 Decommissioning

The proposed development is expected to be operational until at least the end of 2029.On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and IE licences, unless otherwise authorised. The DMP and CRAMP will be updated to include the proposed development for agreement with the EPA once construction is substantially complete.

It is envisioned that on decommissioning some of the structures on site may be used for future developments such as those which may be linked to the Green Atlantic @ Moneypoint project which is in the early design and feasibility study stages.

The activities associated with the decommissioning phase will be similar to those associated with the construction phase. Decommissioning impacts are however assessed for each technical chapter of the EIAR.

5.5.7 Mitigation and Monitoring

Mitigation by design/avoidance is incorporated into the design of the proposals, as described in Chapter 3 and Chapter 4 of this EIAR.

Additional or further mitigation measures and monitoring that have been proposed/implemented for each environmental topic are set out in the technical chapters in this EIAR.

As outlined in the EPA Guidelines 2022, "*offsetting*[13] *can be considered a type of 'Compensation Measure'."* Offsetting will only be considered as a last resort likely significant effects cannot be avoided, prevented or reduced.

5.5.8 Residual Impacts

Residual impacts that remain from the predicted impacts once additional mitigation has been implemented are set out in the technical chapters in this EIAR.

5.5.9 Cumulative Effects

Cumulative effects take account of the addition of many minor or significant effects to create larger, more significant effects. As outlined in the EPA Guidelines 2022, while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant. A single effect which may, on its own, have a significant effect, may also have a reduced and insignificant impact when combined with other effects. Subject to consent being granted, it is anticipated that the construction phase of the project will commence in September 2024, with construction scheduled for completion in March 2026.

Further to a review of planning applications undertaken in November 2023 (and subsequently reviewed again in January 2024), a list of other known existing and/or approved and relevant development and other known planned development which may result in cumulative effects are described in Table 5.2.

There are recent planning applications (within the last 10 years) which have been constructed at Moneypoint Generating Station which already form part the site's baseline environment, namely:

- 1274 / ABP PL03.241624: Development of five wind turbines each having a rated electricity output of approximately 3,000 kW, modification to Electrical Transformer Station, additional

[13] Different considerations apply in relation to the application of mitigation measures and compensatory measures in the context of the assessments required by Articles 6(3) and 6(4) of the Habitats Directive.

control building, two anemometer masts and associated site works These are operational having been commissioned in 2018.

- 14373 / ABP-PL03. 243842: Development which will consist of works to the existing 32 hectare Ash Storage Area, increase in the height of same from the existing maximum level above ordnance datum which is currently 19.5m OD to a proposed maximum level above ordnance datum of 28.4m OD. This will accommodate 1.8 million cubic meters of additional material deposition.
- 20318: Development up to 400 MVA (electrical rating) synchronous condenser which shares the existing 400kV/17kV transformer and 400kV underground cable belonging to the existing coal fired unit 2. Planning permission is being sought for a duration of 10 years. This application represents a relocation within Moneypoint of a similar application permitted by Clare County Council under Reg. Ref. P19/746. This development is operational.

Table 5.2: Cumulative Effect Projects

Project	Planning Reference	Location	Development Description	Date Submitted or Granted
Prospect to Tarbert Cable Project	23350 (Kerry County Council) / 23195 (Clare County Council)	Tarbert Substation (Co. Kerry) / Kilkerrin Point LCIM to Prospect Substation (Co. Clare)	The proposed development will comprise works to Tarbert substation compound and associated 220 kV switchgear bay/ An extension of the existing Kilkerin Point 220 kV Line Cable Interface Mast (LCIM) compound/A new fibre optic cable measuring an approximate length of 8.9km routed between Kilkerin Point LCIM compound (townland of Lakyle North) and Prospect 220 kV substation (townland of Ballygeery West)	Granted by Kerry CC 17/0124: Clare CC decision made 13/12/23 (awaiting final grant)
Tarbert temporary generation plant (not constructed)	EE08.315838	Tarbert Power Station, Tarbert, Island, Co. Clare	The Designated Development consists of the installation of three OCGT units which will collectively have the capacity to generate 150 MWe of temporary emergency electricity, site development and associated ancillary works required for the operation of the plant. The plant will operate as an emergency plant, with a maximum running time of 500 hours per annum, spending the majority of time on standby, and will be run to meet emergency security of supply needs while complementing renewable power generation sources.	29/03/2023 (Recommendations signed by the Minister)
Kilpaddoge high intertia synchronous compensator (not constructed)	21549	Kilpaddoge, Tarbert, Co. Kerry	A high intertia synchronous compensator (hisc) compound containing 1 no. Hisc unit enclosed within a steel clad framed style structure (12.1m max height). Located on lands where a grid stabilisation facility was previously permitted under planning register no 19/115.	Granted - 20/08/2021
Cross Shannon Cable Project (construction phase - 2022/2023)	ABP-307798-20	Between Kilpaddoge Electrical Substation, Co. Kerry and Moneypoint 400 kV Electrical Substation, Co. Clare	Proposed 400 kV electricity transmission cables, extension to the existing Kilpaddoge Electrical Substation and associated works, between the existing Moneypoint 400 kV Electrical Substation in the townland of Carrowdoita South County Clare and existing Kilpaddoge 220/110kV Electrical Substation in the townland of Kilpaddoge County Kerry.	Approved - 04/06/2021
Kilpaddoge BESS (not constructed)	18/878 and ABP appeal Ref. PL08.305739	Kilpaddoge, Tarbert, Co. Kerry	Ten-year permission for the construction of a Battery Energy Storage System (BESS) Facility, to include up to 26 no. self-contained battery container units and associated works.	Grant permission with revised conditions – 10/02/2020
Kilpaddoge Peaker Plant (operational)	13138 / 20850	Kilpaddoge, Tarbert, Co. Kerry	Construct an electricity peaker power generating plant / change the energy source for the charging of the battery energy storage system (BESS) containers from diesel to charging off the national grid	Granted 21/10/2013 and 16/12/2020 respectively

Project	Planning Reference	Location	Development Description	Date Submitted or Granted
Tarbet BESS (not constructed)	18392	Tarbert Power Station, Co. Kerry	Battery storage facility within a total site area of up to 2.278ha, to include 50 no. self-contained battery container units.	Granted 18/02/2019
ESB's Green Atlantic @ Moneypoint – Offshore Wind Farm	ABP - PC03.312734	Moneypoint Generating Station, Co. Clare	Floating offshore wind farm of 1,400MW will be developed off the coast of counties Clare and Kerry in two phases by ESB.	Pre-application submitted 14/02/2022

5.5.9.1 Projects not Included for the Purpose of Cumulative Effects

It is noted that Strategic Infrastructure Development for the proposed Shannon Technology and Energy Park (consisting of power plant, battery energy storage system, floating storage and regasification unit, jetty, onshore receiving facilities and all ancillary works) was refused permission by An Bord Pleanála (ABP case ref: PA08.311233) on 13 September 2023. Neither Shannon Technology and Energy Park, or its associated proposed grid connection (ABP case ref: VC08.318119) will be assessed in the cumulative assessment based upon its refusal. The proposed development was deemed to be contrary to existing national policy on Liquified Natural Gas (LNG) terminals and any approval was deemed to be premature due to the pending publication of a review of Ireland's security of energy supply for electricity and gas systems. Consequently, as the Government's energy security policy is outstanding it is not appropriate to consider the Shannon Technology and Energy Park in advance of its policy publication.

5.5.9.2 Foreshore and Maritime Usage Applications

In the context of foreshore applications relevant to the area surrounding Moneypoint, it is noted that ESB and ESB Wind Development Limited submitted a combined total of three applications for works in Shannon Estuary adjacent to Moneypoint Generating Station.

- FS007137 (ESB Wind Development Ltd.) Moneypoint Offshore Wind Farm – Site Investigations off Clare and Kerry Coasts. Application has not been decided.
- FS007141 (ESB) – Moneypoint Ecological Survey within Ballymacrinan Bay (Ecological survey in the form of nine grab samples for infauna and granulometric analysis to help characterise subtidal habitat and benthic communities). Granted approval by the Minister on 13 October 2020.
- FS006318 (ESB) – Foreshore consent application for construction of two wind turbines and an anemometer mast. Granted approval by the Minister on 04 November 2015. This foreshore consent related to applications – ABP - PL03.241624 / CCC 12/74, which have been constructed.
- LIC230008 (ESB) – An application for a Maritime Usage Licence Application for Marine Site Investigation Works for the Moneypoint Hub Project was submitted to the Maritime Area Regulatory Authority (MARA). The application is currently under review – Decision Pending.

5.5.10 Interactions between Environmental Factors

Interactions between effects may arise from the reaction between effects of the proposed development on different aspects of the environment which may exacerbate the magnitude of those effects. These are also assessed in each technical chapter of the EIAR.

5.6 Competency of EIAR Production Team

Mott MacDonald is a multidisciplinary consultancy with over 20 years' experience of undertaking complex and challenging environmental impact assessments and of writing environmental impact assessment reports for a wide range of projects. These include some of the Ireland's largest infrastructure, engineering and development projects. Mott MacDonald maintains high professional standards amongst staff both individually and across technical areas of practice.

Mott MacDonald is a corporate member of the Institute of Environmental Management and Assessment and holds its EIA Quality Mark. The Quality Mark Scheme allows organisations that lead the co-ordination of statutory EIAs to make a commitment to excellence in their EIA activities and have this commitment independently reviewed. This Quality Mark Scheme is a clear indication that that Mott MacDonald can fully demonstrate the requirements for a 'competent expect' as outlined in the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Report' (2022).

Individually Mott MacDonald's technical staff are subject to annual performance reviews which evaluate their Continued Professional Development. As a business Mott MacDonald maintains technical "Practices" which are internal professional networks that span organisational and geographical boundaries. These help to maintain high professional standards across technical disciples as well as facilitating contribution to the wider development of the Environmental Consulting industry. Specialist consultants have also been commissioned to provide support in the preparation of the EIAR. The credentials and competencies of all respective EIAR contributors is provided in Appendix A of this EIAR.

5.7 Difficulties Encountered

No exceptional difficulties or limitations were experienced in compiling the required information for this EIAR. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

6 Population and Human Health

6.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on Population and Human Health. The assessment is based on the proposed development as described in Chapter 4 of this EIAR.

In relation to population, the assessment considers demographics, land use, community and facilities, tourism and recreation, economic activity and human health.

The EPA Guidelines 2022 state that:

'…in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc'

The analysis of human health consequently considers those impacts associated with relevant environmental disciplines which have been comprehensively addressed elsewhere in this report including:

- Air Quality (Chapter 7);
- Climate (Chapter 8);
- Noise and Vibration (Chapter 9);
- Surface Water Resources and Flooding (Chapter 11);
- Land, Soils and Hydrogeology (Chapter 12);
- Architecture, Archaeology and Cultural Heritage (Chapter 13);
- The Landscape (Chapter 14);
- Traffic and Transport (Chapter 15);
- Material Assets including waste (Chapter 16); and
- Major Accidents and/or Disasters (Chapter 17).

Mitigation and monitoring measures, residual impacts and cumulative impacts are also discussed where appropriate.

6.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Population and Human Health topic are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

6.2.1 Policies

- Regional Spatial and Economic Strategy for the Southern Region, 2020
- Clare County Development Plan 2023-2029
- Tourism Development & Innovation a Strategy for Investment 2016-2022 (Fáilte Ireland, 2016)

6.2.2 Guidelines

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects (Fáilte Ireland, 2018)
- EirGrid Evidence Based Environmental Study 9 Settlement and Landuse (EirGrid 2016)
- EirGrid-Evidence-Based-Environmental-Study-1-EMF (EirGrid, 2014)
- The Institute of Public Health (IPH), Health Impact Assessment Guidance, Standalone HIA and health in environmental assessment (2021) (Pyper et al., 2021)
- International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA), Human health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment (2020) (Cave et al., 2020). This reference paper informed the IPH guidance.
- Effective Scoping of Human Health in Environmental Impact Assessment (IEMA, 2022); and
- Determining Significance For Human Health In Environmental Impact Assessment (IEMA, 2022)

6.3 Methodology

6.3.1 Approach to Data Collection

The following information and data sources (Table 6.1) have been considered during the production of this EIAR.

Table 6.1: Data Sources used to inform the Population and Human Health chapter of this EIAR

Data Source	Date	Data Contents
Central Statistics Office (CSO) www.cso.ie	Census 2022, 2016 Labour Force Data (Monthly)	Demographics Settlements Labour Force Survey
EirGrid Evidence Based Environmental Study 9 Settlement and Landuse (EirGrid)	2016	Settlements Land use
Geodirectory Data	Various	Settlements Land use
Ordnance Survey Ireland (OSI) Mapping and aerial photography (www.osi.ie)	Various	Settlements Land use
Regional Seascape Character Assessment for Ireland as they relate to Seascape Character Area 8 (Shannon Estuary and Tralee Bay)	2020	Marine use
Clare County Council Planning Enquiry System (https://www.eplanning.ie/ClareCC/searchtypes)	Various	Settlements Land use
Corine land cover data (www.epa.ie)	2018	Land use
Open Street Mapping (www.openstreetmap.org)	Various	Land use
All-Island Research Observatory (AIRO) Primary and Post Primary Schools	Various	Land use
Google Street Mapping	Various	Land use
Health Services Executive (www.hse.ie)	Various	Human Health
Fáilte Ireland (www.failteireland.ie.)	Various	Tourism and amenity

Data Source	Date	Data Contents
EPA Radon Risk Map for Ireland (https://gis.epa.ie/EPAMaps/)	2023	Radon risk

6.3.2 Approach to Impact Assessment

This chapter has been prepared having regard to the methodology described in Chapter 5.

The EPA Guidelines 2022 identify “sensitive receptors” as neighbouring landowners, local communities and other parties which are likely to be directly affected by the proposed development. In particular homes, hospitals, hotels and holiday accommodation, schools and rehabilitation workshops and commercial premises are noted. Regard is also given to transient populations including drivers, tourists and walkers.

The IPH guidance includes an extensive list of health determinants that can be used to identify health risks and health issues in impact assessments. Some of these determinants are related to only health impacts and some are related to both population and human health impacts. The IEMA guidance *Effective Scoping of Human Health in Environmental Impact Assessment* also states wider determinants of health. Based on these guidance documents and broad categories identified in the EPA Guidelines 2022, a desktop review of following categories is conducted:

- Land Use;
- Population (Demographics and Settlement Patterns);
- Housing;
- Employment and Economic Activity;
- Tourism and Recreation;
- Community Facilities and Amenities; and
- Human Health

The determinant under each category, based on IPH guidance, and its relevance to the proposed development is listed in Table 6.2.

Table 6.2: Categories and Determinants for Population and Human Health Assessment

Category/ Determinant[14]	Relevance to the Proposed Development
Land Use	
● Spatial planning, use classes, zoning and land allocations (including streets and routes, places, urban green space, parks, landscape)	Yes
Population (Demographics and Settlement Patterns)	
● Family structure and relationships	No
● Population in-migration (including effects on minorities, community cohesion and social isolation)	No
● Population out-migration (including effects on minorities, community cohesion and social isolation)	No
● Settlement patterns	Yes
Housing	
● Dwelling mix for community needs (supply)	No
● Community cohesion and social isolation	No
● Indoor environment (indoor air quality, safety, hygiene and level of crowding)	No

Category/ Determinant[14]	**Relevance to the Proposed Development**
● Residential segregation	No
● Outdoor environment (safety, green and blue spaces and proximity to disease vector habitats)	Yes
● Affordability	No
● Connectivity and access	Yes
● Community services (including childcare and social services) accessibility and quality	Yes
● Social housing	Yes
● Specialist adaptations (e.g., age or disability)	No
● Flood risk	Yes – Discussed in Chapter 11
● Loss of existing housing	No
Employment and Economic Activity	
● Employment (including quality and income)	Yes
● Unemployment (including job insecurity)	Yes
● Procurement and investment	No
● Working conditions (rewards, controls and occupational hazards)	No
● Health inequalities, social exclusion and poverty	No
● Population displacement, labour productivity and economic loss	No
● Economic benefits	Yes
Tourism and Recreation	
● Tourism facilities	Yes
Community Facilities and Amenities	
● Road or route safety	Yes – Discussed in Chapter 15
● Active travel (pedestrians and cyclists)	No
● Public transport (access, connectivity and quality)	No
● Health, education and social care journey times	No
● Emergency response times	No
● Community severance	No
● Age, sensory and mobility considerations	No
● Access to shops, retail food resources, financial and commercial services	No
● Susceptibility to major accidents and/or disasters (including earthquake, water surge, wildfire, landslide, pandemic etc.)	Yes – Discussed in Chapter 16
● Open space (green and blue) and physical activity (including in natural habitats)	No
● Sports, leisure and recreational amenities and facilities (including play)	No
● Sports, leisure and recreational connectivity and access (including safety)	No
● Sports, leisure and recreational age, sensory and mobility considerations	No
● Injury risk (including drowning and falls)	No
● Waste management (including sanitation systems and wastewater reuse)	Yes – Discussed in Chapter 16
● Police/security and emergency response	No
● Actual and perceived crime	No
● Safeguarding and modern slavery	No
● School accessibility, capacity and quality	No

Category/ Determinant[14]	Relevance to the Proposed Development
● Adult skills development	No
● Transitional traffic arrangements (e.g. during construction)	Yes – Discussed in Chapter 15
● Visual landscape/townscape change	Yes – Discussed in Chapter 14
● Visual lighting change (night lighting, overshadowing or reflections)	Yes – Discussed in Chapter 14
● Social networks and culture (including sites of cultural significance)	Yes – Discussed in Chapter 13
● Agricultural landholdings (including loss and severance)	No
● Wider societal benefits to energy infrastructure	Yes – Discussed in Chapter 2
● Wider societal benefits to transport infrastructure	No
● Wider societal benefits to waste management infrastructure	No
● Wider societal benefits to water infrastructure	No
● Wider societal benefits to communication and IT infrastructure	No
● Wider societal benefits to climate change (including improved air quality and preparedness for extreme weather events such as heat, storms and/or flooding)	Yes – Discussed in Chapter 7
● Wider societal benefits to the natural environment (including biodiversity, natural spaces, forestry and habitats)	No
Human Health	
● Health promotion (including smoking cessation)	No
● Substance misuse (including alcohol)	No
● Problem gambling	No
● Communicable illness (including STIs and other infections)	No
● Diet (including production and access to affordable healthy food options)	No
● Exacerbation of chronic cardiovascular and respiratory conditions	No
● Exposure to food, water- and vector-borne infection or toxins	No
● Food production and malnutrition	No
● Extreme weather, heat stress and flood risk and fire injury risk	Yes – Discussed in Chapter 16, 17
● Industrial Activities (IPC, IPPC, IE facilities)	Yes
● Primary care accessibility, capacity and quality	No
● Secondary care (including hospitals) accessibility, capacity and quality	No
● Ambulance service accessibility, capacity and quality	No
● Social services accessibility, capacity and quality (including use of community centres)	No
● Health protection (including screening and epidemic response) accessibility, capacity and quality	No
● Occupational health services accessibility, capacity and quality	No
● Dental service accessibility, capacity and quality	No
● Pharmacy accessibility, capacity and quality	No
● Sexual health services accessibility, capacity and quality	No
● Mental health services accessibility, capacity and quality	No
● Recruitment and retention of staff	No
● Preparedness for emergency scenarios (major accidents and/or disasters)	No
● Dust, particulates and aerosols (indoor and outdoor)	Yes – Discussed in Chapter 7

Category/ Determinant[14]	**Relevance to the Proposed Development**
● Air quality conditions associated with plant, processes and vehicle emissions	Yes – Discussed in Chapter 7
● Odour	No
● Drinking water quality (including biological and chemical agents)	No
● Drinking water – quantity or access	No
● Bathing water quality (including biological and chemical agents, disease vectors)	Yes – Discussed in Chapter 11
● Mobilisation of historic pollution	Yes – Discussed in Chapter 7, 11
● Risk of new ground pollution (e.g., industrial agents or accidental spills)	Yes – Discussed in Chapter 11
● Food resources and safety (e.g., agricultural land availability and quality)	No
● Noise conditions associated with plant, processes and vehicle disturbance	Yes – Discussed in Chapter 9
● Vibration	Yes – Discussed in Chapter 9
● Electro-magnetic fields, actual risk	No
● Electro-magnetic fields, understanding of risk (risk perception)	No
● Ionising, actual risk	No
● Ionising, understanding of risk (risk perception)	No

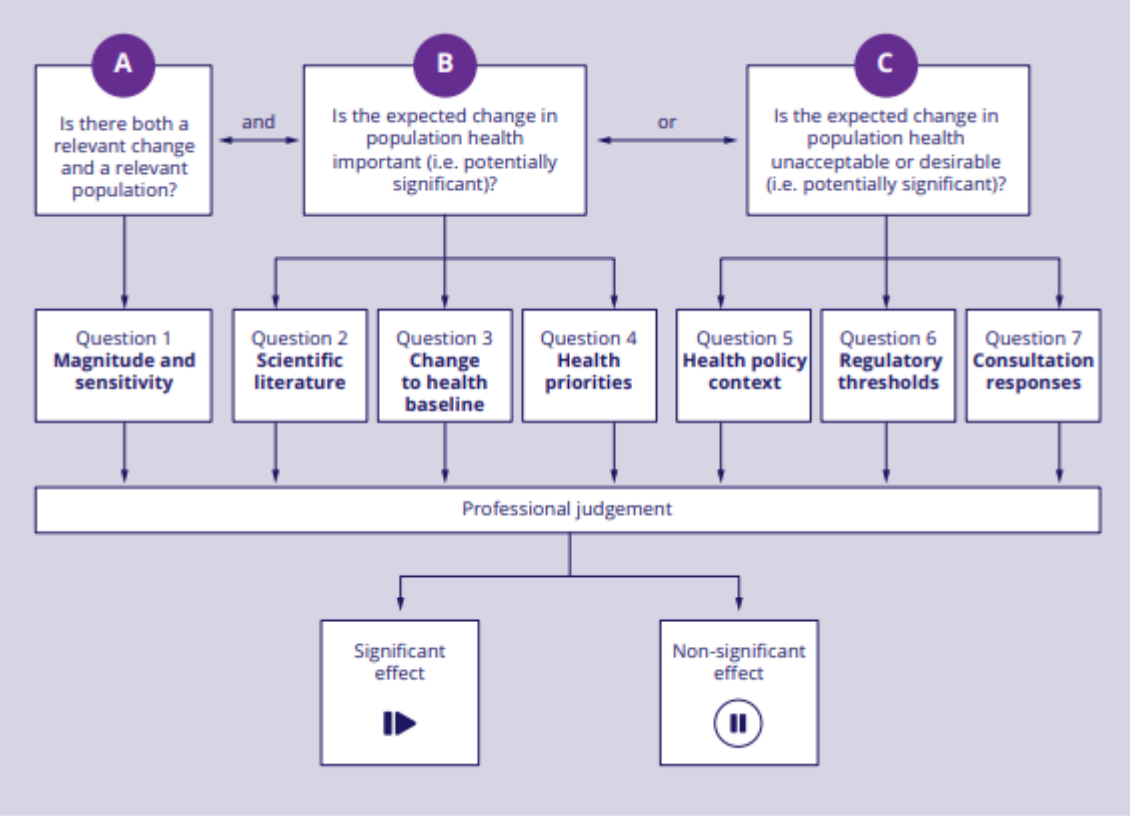
Using each determinant likely significant effects on population and human health have been identified. The IPH guidance states that:

'Likely' health effects are those that, based on the scientific literature, have a plausible theoretical link between source-pathway-receptor, the occurrence of which in the relevant context is probable based on professional judgement.

'Significant' health effects are those that, based on professional judgement, are important (a positive or negative effect), highly desirable (a positive effect) or unacceptable (a negative effect) for population health with regards to changes triggered by the proposal in question.

The IPH guidance provides a list of questions to be considered for population and human health assessment, as provided in Figure 6.1. A positive response indicates a significant effect and a negative response indicates a non-significant effect. The approach adopted for each question is summarised below.

Figure 6.1: Determining Significance for Population and Human Health Assessment



Source: Figure M12; IPH Guidance 2021

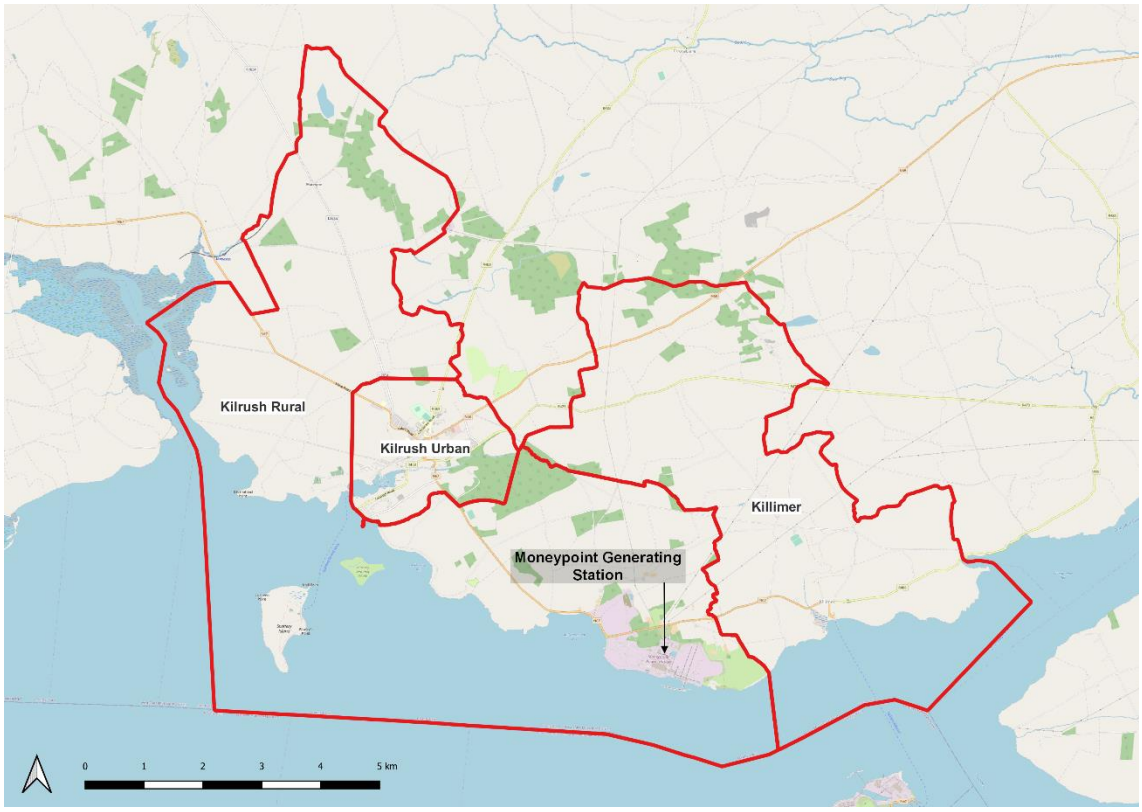
- Magnitude and Sensitivity: The approach in identifying magnitude of impacts and sensitivity of receptors is adapted from the IPH guidance and the EPA Guidelines 2022. The sensitive receptors are listed in Section 6.4. The magnitude of impacts is defined in Section 6.5.
- Scientific Literature: The guidance documents listed in Section 6.2 and other relevant literature is referred to for identifying relationship between a potential source and sensitive receptors.
- Change to Health Baseline: The receiving environment as described in Section 6.4 is considered as the baseline for the impact assessment. Any proposal resulting in a substantial change to the baseline is considered to have a significant impact.
- Health Priorities: Due to the nature of the works, it is anticipated that the proposed development will not impact the local, regional and national health priorities and hence, this is not taken into account further.
- Health Policy Context: Due to the nature of the works, it is anticipated that the proposed development will not impact on local, regional and national health policies and hence, this is not taken into account further.
- Regulatory Thresholds: Such thresholds are considered in other sections, for example for air quality and noise impacts.
- Consultation Responses: No consultation response focused on population and human health impacts and hence, this is not taken into account further.

6.3.3 Study Area

The study area for population and human health assessment is typically defined by the Electoral Division (ED) in which the proposed development site is located. ED is the smallest legally defined administrative area in the State for which Small Area Population Statistics (SAPS) are published from the Census.

The Moneypoint Generating Station is located within the ED of Kilrush Rural. To assess the impacts of the proposed development on the closest settlement, Killimer, and the closest town, Kilrush, two other EDs have been added to the study area for population and human health assessment as shown in Figure 6.2. Census data for the wider area of County Clare was also considered in the desk-based assessment.

Figure 6.2: Study Area for Population and Human Health Assessment



Source: CSO 2022 (Mapping: © OpenStreetMap contributors)

6.4 Receiving Environment

The proposed development is located within the site of the Moneypoint Generating Station on the northern shore of the [Lower] Shannon Estuary, in the townlands of Carrowdotia North, Carrowdotia South and Ballymacrinan. Moneypoint Generating Station is located approximately 4km southeast from Kilrush, the nearest town, and approximately 1.8km west of Killimer, the nearest settlement.

Kilrush is identified in the settlement hierarchy of Clare County Development Plan 2023-2029 as ‘Service Towns’ and Killimer as ‘Large Villages’. The construction of Moneypoint Generating

Station between 1979 and 1987 represented a turning point for the economic prosperity of Kilrush and its hinterland[15].

There are two definable clusters of industry on the Shannon Estuary, one concentrated broadly around Moneypoint, Tarbert and Ballylongford, and another focussed around Foynes, Aughinish and Cahiracon. The Moneypoint Generating Station, when combined with Tarbert on the south shore, forms a significant industry and energy hub on the Estuary[16].

The *Strategic Integrated Framework Plan for the Shannon Estuary*[17] identifies sites within the Shannon Estuary that are of strategic significance in nationally and regionally in terms of their contribution to the security and diversity of energy supply and further economic potential. Moneypoint is identified as one such 'Strategic Development Location'.

The immediate environment of proposed development site is dominated by agricultural land use with one off housings. To the south of the Moneypoint Generating Station is [Lower] Shannon Estuary and the lands across the estuary in County Kerry are mainly agricultural, apart from the presence of Kilpaddoge Substation in the townland of Kilpaddoge and Tarbert Power Station on Tarbert Island.

The nearest residential property is approximately 25m to the west of the red line boundary, as shown in Figure 1.2.

6.4.1 Land Use

As per the Clare County Development Plan 2023-2029, the development site is located within 'Strategic Development Location B – Moneypoint' and has been zoned for 'Marine-Related Industry' as illustrated in Figure 6.3. The Moneypoint Generating Station is also identified as 'Rural Areas Under Strong Urban Influence' in the CDP[18]. The Moneypoint Generating Station is a long-established industrial area and no works are proposed outside the existing boundary of the station complex.

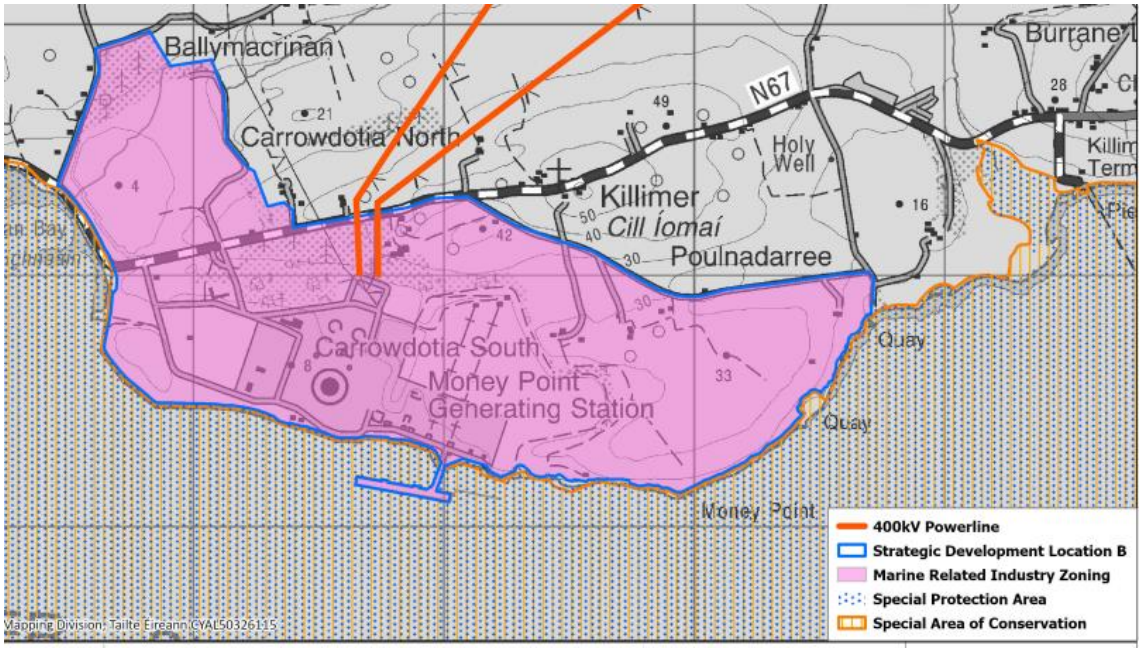
[15] Volume 3d West Clare Municipal District, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-3d-west-clare-municipal-district-clare-county-development-plan-2023-2029-51396.pdf)

[16] Volume 1 Written Statement, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-1-written-statement-clare-county-development-plan-2023-2029-51406.pdf)

[17] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

[18] Map H10, Volume 2 Maps, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-2-maps-clare-county-development-plan-2023-2029-51395.pdf)

Figure 6.3: Land Use Zoning Context of Proposed Development Site



Source: Clare County Council Development Plan 2023-2029, Map 12B Strategic Development Location B

The Corine Land Cover 2018 map categorises the land use of the development site under three categories, as listed below.

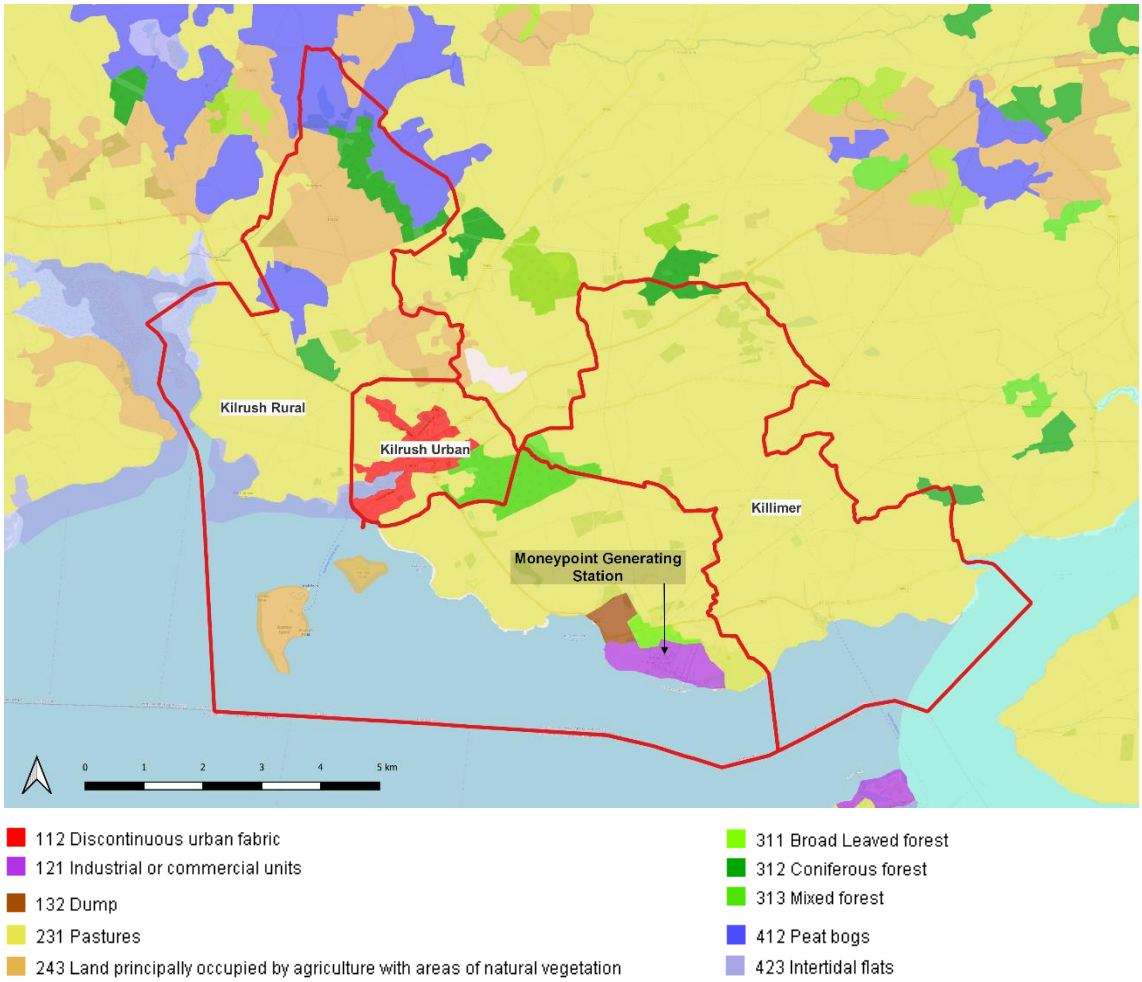
- Level 1 ‘Artificial surfaces’ and Level 13 ‘Mines, dumps and construction sites’ (132) – Ash Storage Area
- Level 3 ‘Forest and semi-natural areas’ and Level 31 ‘Forest’ (311) – Open area to the north
- Level 1 ‘Artificial surfaces’ and Level 2 ‘Industrial, commercial and transport units’ (121) – Rest of the site

The lands in vicinity of the Moneypoint Generating Station are categorised as Agricultural Areas-Pastures (231). Other land uses within the study area are Forest and semi-natural areas - Mixed forests (313), Artificial surfaces - Urban fabric (112) (associated with Kilrush town), Coastal wetlands (423), Forest and semi-natural areas - coniferous forests (312), Inland wetlands - Peat bogs (412) and Heterogeneous agricultural areas (243).

The Corine Land Cover map for the study area is shown in Figure 6.4.

The proposed development is located within the site of the existing Moneypoint Generating Station complex; hence no land use change will occur due to the proposed development works.

Figure 6.4: Land Use within Population and Human Health Assessment Study Area



Source: Corine Land Cover Map 2018; EPA 2018 (https://gis.epa.ie/EPAMaps/) (accessed August 2023)

6.4.2 Population (Demographics and Settlement Patterns)

The proposed development is situated in the administrative boundary of Clare County Council. The population of County Clare in 2022 was 127,938, having increased from 118,817 in 2016, lower than the national average at 7.7%. The population within the study area is shown in Table 6.3. From 2016 to 2022, the population growth in Kilrush Rural was significantly lower than the national average at 2% and in Kilrush Urban the growth was higher than the national average at 9%. Killimer noted a 11% decline in population from 2016 to 2022.

Within the study area approximately 59% of population is of the working age (between 15 and 64 years), which is lower than the national average of 65%.

Table 6.3: Population Data within Population and Human Health Assessment Study Area

Electoral Division	Category	Population 2022	Population 2016
Kilrush Rural	Total Females	356	346
	Total Males	382	380
	Total Population	738	726
Kilrush Urban	Total Females	1,442	1,338
	Total Males	1,348	1,233

Electoral Division	Category	Population 2022	Population 2016
	Total Population	2,790	2,571
Killimer	Total Females	201	232
	Total Males	224	248
	Total Population	425	480
Study Area Population	Total	3,953	3,777

Source: CSO 2022 (https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/), CSO 2016 (https://census2016.geohive.ie/datasets/geohive::population-by-sex-and-marital-status-electoral-division-census-2016-theme-1-2-ireland-2016-cso-osi/explore?location=52.590148%2C-9.360700%2C11.96) (accessed January 2024)

The settlement pattern in the immediate environment of proposed development site and within the study area is dispersed, apart from Kilrush town. The settlement pattern in Kilrush town is linear and nucleated.

There are few sections of linear settlement pattern along local roads in Kilrush Rural and Killimer, although there are majorly one-off housings within these EDs. The housing statistics are detailed in Section 6.4.3.

6.4.3 Housing

Kilrush town is located approximately 4km northwest of the Moneypoint Generating Station and is the nearest urban centre with a population of 2,790. Killimer is located 1.8km east of the Moneypoint Generating Station and the CDP notes that "*Killimer's proximity to the main service centre of Kilrush and to ESB Moneypoint contribute to its appeal as a popular place to live*"[19].

According to Census 2022, there are 1,582 private households within the study area with average 92% of these comprising of houses and bungalows. This is higher than the national average of approximately 87% private households comprising of houses and bungalows. Table 6.4 shows the private housing types within the three EDs.

Table 6.4: Type of Accommodations within Population and Human Health Assessment Study Area

Electoral Division	Type of Accommodations	Households by Type
Kilrush Rural	Houses/bungalows	98.2%
	Flats/apartments	1.4%
	Bed-sits	0 %
	Caravan/mobile homes	0.4%
Kilrush Urban	Houses/bungalows	89.4%
	Flats/apartments	10.6%
	Bed-sits	0%
	Caravan/mobile homes	0%
Killimer	Houses/bungalows	98.3%
	Flats/apartments	1.1%
	Bed-sits	0%
	Caravan/mobile homes	0.6%

Source: CSO 2022 (https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/) (accessed January 2024)

[19] Volume 3d West Clare Municipal District, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-3d-west-clare-municipal-district-clare-county-development-plan-2023-2029-51396.pdf)

The closest residential receptor to the proposed development is located approximately 25m west of the red line boundary. A review of planning applications and publicly available mapping in the area show that there are currently no planned residential developments within 500m of the site.

6.4.4 Employment and Economic Activity

The location of the proposed development is within the Moneypoint Generating Station complex. As stated in the Clare CDP 2023-2029, the Moneypoint Generating Station, when combined with Tarbert on the south shore, forms a significant industry and energy hub on the Estuary. Currently, there are approximately 130 Full Time Equivalent (FTE) personnel working on site on a daily basis, this consists of ESB staff and contractors.

Moneypoint makes a very significant contribution to the local economy and the facility continues to be strategically important regionally and nationally in terms of capacity, diversity and security of supply, providing critical energy storage in an increasingly volatile global energy market[20].

The Census 2022 states that approximately 44% population aged 15 years and over within the study area are 'at work'. This is lower than the national average of 56%[21].

Table 6.5 illustrates employment by industry for the study area. Approximately 26% of people are employed in professional services, the prominent employment industry within the three EDs. This is similar to the country's trend where approximately 25% are employed in professional services nationally. In Kilrush Rural and Kilrush Urban, the second prominent employment industry is commerce and trade similar to the trend in Ireland. Whereas in Killimer, the second majority of the people are employed in agriculture, forestry and fishing as shown in Table 6.5.

Table 6.5: Employment by Industry within Population and Human Health Assessment Study Area

Electoral Division	Industry	Employment by Industry
Kilrush Rural	Agriculture, forestry and fishing	9.4%
	Building and construction	9.4%
	Manufacturing industries	11.8%
	Commerce and trade	20.6%
	Transport and communications	5.2%
	Public administration	3.6%
	Professional services	23.6%
	Other	16.4%
Kilrush Urban	Agriculture, forestry and fishing	1.4%
	Building and construction	3.7%
	Manufacturing industries	8.8%
	Commerce and trade	23.4%
	Transport and communications	6.2%
	Public administration	4.5%
	Professional services	27.2%
	Other	24.7%

[20] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

[21] CSO 2022 https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/ (accessed January 2024)

Electoral Division	Industry	Employment by Industry
Killimer	Agriculture, forestry and fishing	18.8%
	Building and construction	9.1%
	Manufacturing industries	6.5%
	Commerce and trade	17.2%
	Transport and communications	8.1%
	Public administration	9.7%
	Professional services	22.6%
	Other	8.1%

Source: CSO 2022 (https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/) (accessed January 2024)

The CDP notes the potential and significance of economy based on marine tourism along the coastal areas of County Clare, including Kilrush and Killimer.

The Regional Economic and Spatial Strategy for the Southern Region (RSES) recognises and supports the economic role and potential of Kilrush as an economic driver in a potential North Kerry/West Limerick/Clare network, along with Listowel, Abbeyfeale and Newcastle West, connected with the Shannon Estuary[22]. The CDP also notes that Moneypoint Generating Station has played an important role in the economy of Kilrush for over 30 years[23].

Kilrush is a designated Service Town with considerable potential to increase contribution to the regional economy and the town's rural hinterland. The CDP notes that commercial aquaculture represents a growing industry in the Estuary, with numerous licensed activities prevalent along the coastal areas of County Clare, at Carrigaholt, Poulnasherry and Kilrush[24].

There is a wealth of opportunities in Kilrush as a heritage town, both in terms of natural and built heritage, along with a blue flag beach at Cappa, Scattery Island, dolphin watch, tourist trails and the cruise on the Shannon Estuary. Kilrush hosts one of the largest marinas where the majority of dolphin-watching boat trips and the day trips to Scattery Island are based. It provides important services for the smaller vessels, which the local communities rely on[25].

For Killimer, the CDP notes that the village offers a strategic location as a base for maintenance crews servicing the renewable energy sector in Counties Clare, Kerry, and Limerick[26]. Killimer is also noted as an area of opportunity for aquaculture in the CDP[27].

[22] Volume 3d West Clare Municipal District, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-3d-west-clare-municipal-district-clare-county-development-plan-2023-2029-51396.pdf)

[23] *Ibid.*

[24] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

[25] *Ibid.*

[26] Volume 3d West Clare Municipal District, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-3d-west-clare-municipal-district-clare-county-development-plan-2023-2029-51396.pdf)

[27] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

6.4.5 Tourism and Recreation

The Moneypoint Generating Station complex sits on the shore of Shannon estuary which is known to host several tourism opportunities. The nearby settlements of Kilrush and Killimer are also known for tourism.

Shannon Estuary is a part of the Wild Atlantic Way, a 2,600km defined coastal route along the Irish west coast. The Wild Atlantic Way follows the west coast of County Clare, from Killimer to New Quay in North Clare. A series of seventeen Discovery Points and Signature Discovery Points have been identified in County Clare, encompassing the most scenic and high-amenity areas along the route. Within the study area there are three such Discovery Points; Killimer – Tarbert Ferry, Scattery Island, and Cappagh Pier (Embarkation Point for Scattery Island). All three Discovery Points are located at a significant distance from the Moneypoint Generating Station complex; therefore these are not discussed further.

The CDP notes that there are sea angling and observational marine tourism, and nature-based tourism opportunities on the Shannon Estuary Way[28][29].

The CDP supports the development of the West Clare Railway Greenway along the line of the old West Clare Railway as a proposed recreational route. One section of the greenway runs from Kilrush to Kilkee and is within the study area. However, due to the distance between the Greenway and proposed works within the Moneypoint Generating Station complex this project is not considered further.

Within the study area also lies Scattery Island (Inis Cathaigh) which is a low fertile island in the Shannon Estuary, about 2.5km from Kilrush. A regular ferry service operates from Kilrush and there is an Office of Public Works (OPW) run heritage centre on the island with free walking tours. As there are no construction works proposed within the Shannon Estuary, and no proposed increase in shipment activity during operation, the impacts on Scattery Island tourism site are not assessed further.

As mentioned above, Kilrush, the nearest town to the proposed development, is known for its diverse tourism and well-developed marina facilities. Killimer's location on the Wild Atlantic Way is also ideally placed to strengthen its economy based on tourism activity due to the ferry terminal, scenic landscape, and stunning views of the Shannon Estuary. There are opportunities for the development of a range of tourism-related activities, including local crafts and signature food products as well as niche activities such as bird watching and landscape painting.

A car ferry between Killimer, Co Clare and Tarbert Co Kerry provides a key marine transportation route across the Shannon Estuary, creating a tourist amenity, and providing a crucial resource for the local community[30].

6.4.6 Community Facilities and Amenities

There are no schools, community centres, health clinics or hospitals within 500 m of the proposed development. There is a church, Church of St Imy, approximately 450 m north of the proposed development, along the N67.

[28] Volume 1 Written Statement, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-1-written-statement-clare-county-development-plan-2023-2029-51406.pdf)

[29] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

[30] Volume 9 Strategic Integrated Framework Plan for the Shannon Estuary, Clare County Development Plan 2023-2029 (https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/adoption/volume-9-strategic-integrated-framework-plan-for-shannon-estuary-clare-county-development-plan-2023-2029-51393.pdf)

The nearest school to Moneypoint Generating station is Kilrush School, approximately 4.7km northwest in Kilrush town. The nearest health facility is Kilrush Health Centre (a primary care centre), approximately 4.7km to the northwest in Kilrush town.

6.4.7 Human Health

6.4.7.1 General Health and Health Facilities

The general health of population within the study area is at a good status. The majority of the population reports having very good health, similar to the trend in the country. Thus, the population within the study area is considered to have low sensitivity to the proposed works with regards to human health. Approximately 3% of the population within the study area are categorised as having 'Bad' and 'Very Bad' health which is higher than the national average of 1.7%.

Table 6.6 illustrates the population by general health data for the study area.

Table 6.6: Population by General Health for Population & Human Health Study Area

Electoral Division	General Health Category	Population by General Health Category
Kilrush Rural	Very Good	54.9%
	Good	29.7%
	Fair	10.3%
	Bad	1.8%
	Very Bad	0.4%
	Not Stated	3.0%
Kilrush Urban	Very Good	39.0%
	Good	33.0%
	Fair	16.0%
	Bad	3.3%
	Very Bad	0.7%
	Not Stated	8.1%
Killimer	Very Good	52.0%
	Good	33.4%
	Fair	9.9%
	Bad	0.7%
	Very Bad	0.5%
	Not Stated	3.5%

Source: CSO 2022 (https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/) (accessed January 2024)

There are no hospitals within the study area, however, there is a primary care centre (Kilrush Health Centre) within the study area, approximately 4.7km northwest of the proposed development site.

6.4.7.2 Radon

Radon gas is a naturally occurring radioactive gas, originating from the decay of uranium on rocks and soils. Radon dissipates readily in open air and is not considered harmful. However, in enclosed spaces, such as a building, radon can accumulate to unacceptably high concentrations. Radon is measured in Becquerel's per cubic metre of air (Bq/m^3).

Information on radon levels around the proposed development site was obtained from the Radon Risk Map of Ireland developed by the EPA. This map shows a prediction of the number of the houses in any one area that are likely to have high radon levels. The radon levels illustrated on this map for residential areas within the study area indicate that the site is located within Low to High Radon Areas.

6.4.7.3 Industrial Emissions Licence

Moneypoint Generating Station site is licenced by the EPA under an Industrial Emissions Licence [Ref. P0605-04].

There are two other licenced facilities within the study area, both in Kilrush. Shannonside Building Supplies Limited (P0319-01) is approximately 3.9km northwest of Moneypoint Generating Station. Saint-Gobain Performance Plastics Ireland Limited (P0096-03) is approximately 4.2km northwest of Moneypoint Generating Station.

6.4.7.4 COMAH

The Moneypoint Generating Station is an Upper Tier Seveso site and is subject to the provisions of the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (COMAH Regulations, 2015).

A Technical Land Use Planning Report has been prepared by PM Group, see Appendix D. The report concludes that the risk of a major accident at the ESB Moneypoint site as a result of the proposed development is acceptably low with respect to the Land-use Planning criteria.

6.5 Likely Significant Impacts

The likely significant impacts on population and human health associated with air, noise and dust emissions and traffic are discussed in the specialist chapters within this EIAR. This chapter considers likely significant impacts on:

- Land Use
- Population (Demographics and Settlement Patterns)
- Housing
- Employment and Economic Activity
- Tourism and Recreation
- Community Facilities and Amenities
- Human Health

The impacts are described in accordance with Section 5.5 using the population and human health determinants listed in Table 6.2.

6.5.1 Do Nothing

If Moneypoint were to cease generating completely it is possible that extended power outages could occur in the absence of sufficient generators to cover the winter peaks in the period 2024 to 2029. This would have a significant adverse effect in terms of energy requirements and supply on the island of Ireland. See further details in Chapter 3 (Alternatives Considered). To maintain security of electricity supply it would be necessary to continue the operation of Moneypoint fuelled by coal. The continued operation on coal and continued use of consented FGD by-product storage will also have a knock-on effect on the development of the Green Atlantic @ Moneypoint, which will provide a construction base for offshore wind development post 2025. The effect on population and human health would likely remain unchanged from the current operations.

6.5.2 Construction Phase

6.5.2.1 Land Use

No change in terms of land use is proposed as the proposed development is located within the site of the existing Moneypoint Generating Station complex. Neutral / imperceptible impacts on land use are predicted.

6.5.2.2 Population (Demographics and Settlement Patterns)

Significant impacts on population (demographic profile or settlement patterns) during the construction phase as a result of the proposal are unlikely due to the scale of the proposed development. As the proposed development is located within the site of the existing Moneypoint Generating Station complex, the proposed development will have no significant impacts on the population within the study area.

The population within the study area is considered to have low sensitivity to proposed works. Neutral / imperceptible impacts on population are predicted.

6.5.2.3 Housing

Significant impacts on housing during the construction phase as a result of the proposal are unlikely due to the scale of the proposed development. There is no proposed housing development within 500m of the proposed works. Air quality and noise impacts on the nearest residential receptor, approximately 25m from the red line boundary, are discussed in Section 7 and Section 9 of this EIAR.

Significant impacts on housing affordability, connectivity to housing, access to community services, and outdoor environment for residential areas are unlikely. Due to an absence of social housing within 500m of the proposed works, significant impacts on social housing are also unlikely. Therefore, neutral / imperceptible impacts on housing are predicted.

6.5.2.4 Employment and Economic Activity

During peak construction works, 90-100 personnel are anticipated on site. As stated above, Moneypoint makes a very significant contribution to the local economy in the area and employment opportunities are expected to further increase within the study area due to construction works. There will also be a temporary and imperceptible increase in economic spend in the local communities during the works as a result of construction workers spending in the area. Adverse impacts on unemployment are unlikely.

Significant impacts on marine tourism-based economy along coastal areas of Kilrush and Killimer are also unlikely, due to the scale of proposed works and the location of proposed works within the existing Moneypoint Generating Station Complex.

Moneypoint is an active site and works are always being carried out within the complex. The impacts on community receptors (driver delay, pedestrian delay, severance) due to construction traffic are assessed in Section 15.5.3 in Chapter 15 Traffic and Transport.

Therefore, temporary imperceptible positive impacts on employment and economic activity are predicted.

6.5.2.5 Tourism and Recreation

Shannon Estuary, south of Moneypoint Generating Station, provides nature-based and marine tourism opportunities throughout the estuary and in the coastal towns and villages along the estuary. No construction works are proposed outside the existing Moneypoint Generating station complex. No construction works are proposed within the Shannon Estuary and the

foreshore area. The ability for the local community to use and enjoy the area will not be significantly impacted as people will continue to be able to access and use these popular areas.

Significant impacts on heritage tourism in Kilrush are also unlikely. There will be no significant impacts on tourists visiting Kilrush for the Shannon Dolphin and Wildlife Centre or the wildlife tours/ferry services in the Shannon Estuary. Similarly, significant impacts are unlikely on the car ferry route between Killimer and Tarbert, which provides a tourist amenity and a crucial resource for the local community.

Areas of open and recreational space within the study area are of medium sensitivity value as there are limited alternative facilities for communities in Killimer and Kilrush. The magnitude of change is negligible as the community would still be able to access and use the open areas. The landscape and visual impacts due to proposed development are discussed in Chapter 14.

Therefore, neutral / imperceptible impacts on tourism and recreation are predicted.

6.5.2.6 Community Facilities and Amenities

Due to the location of the site, significant impacts on access to community facilities and amenities and capacity and quality of these facilities are unlikely. The proposed works are restricted to the site of existing Moneypoint Generating Station and will not result in any community severance. Temporary imperceptible adverse impacts on emergency response times, along the N67 to Killimer and Kilrush, due to construction traffic are likely to occur. Traffic flows will remain much lower than the capacity of the road, even where construction traffic flows increase; as such, the road network continues to function well. The TMP to be prepared during construction stage will address these concerns and minimise adverse impacts.

The impacts on community receptors (driver delay, pedestrian delay, severance, non-motorised user (NMU) amenity) due to construction traffic are assessed in Section 15.5.3 in Chapter 15 Traffic and Transport.

6.5.2.7 Human Health

The requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006, as amended, will be implemented and complied with in full during the construction phase of the development. As with any construction project, there is still however potential for adverse impacts associated with the natural environment and nuisance (such as air and noise emissions and traffic). The potential for these effects is discussed separately within the respective chapters of this EIAR. There will be no significant offsite health risks. Significant impacts on access to health and medical facilities and their capacity and quality are also unlikely. The population within the study area is considered to have low sensitivity to proposed works with regards to human health.

The dust impacts from construction phase are assessed in Section 7.5.1.1 of Chapter 7 Air Quality.

The noise and vibration impacts due to construction works and construction traffic are assessed in Section 9.5.2 in Chapter 9 Noise and Vibration.

The impacts on community receptors (road safety, fear and intimidation) due to construction traffic are assessed in Section 15.5.3 in Chapter 15 Traffic and Transport.

The impacts on water quality in the area and risk of flooding due to construction of proposed development are assessed in Chapter 11 Surface Water Resources and Flooding.

There will be adverse temporary disturbance impacts associated with the proposed development. Given the nature and location of the development, disturbance impacts are expected to be slight during the construction phase.

6.5.3 Operation and Maintenance Phase

6.5.3.1 Land Use

No change in terms of land use is proposed. The proposed development is within the existing boundary of the Moneypoint Generating Station and is consistent with the existing character and land use of the area. Neutral / imperceptible impacts on land use are predicted.

6.5.3.2 Population (Demographics and Settlement Patterns)

As stated in Section 4.4.4, during operation there will be staff on site and the functions will remain as is, i.e., operations, bulk materials, maintenance, technical services and management, with staffing for bulk materials to reflect the transition to HFO operation. There will be personnel on site carrying out routine inspections and maintenance on the proposed facility. Given the nature of the proposed development and Moneypoint being recognised as an out of market generator of last resort, the operational phase will not have a significant impact on demographics or settlement patterns of the area. Neutral / imperceptible impacts on population are predicted during the operational phase.

6.5.3.3 Housing

Given the nature of the proposed development and the location of the proposed development within the existing boundary of the Moneypoint Generating Station, the operational phase will not have a significant impact on existing or proposed future housing in the area. Neutral / imperceptible impacts on housing are predicted during the operational phase.

6.5.3.4 Employment and Economic Activity

During operation and maintenance phase staffing numbers are to remain as business needs require. The functions will remain as is, i.e., operations, bulk materials, maintenance, technical services and management, with staffing for bulk materials to reflect the transition to HFO operation. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. However, it takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship.

Neutral / imperceptible impacts on employment and economic activity.

A positive effect for the population will be the generation of electricity to meet the demand on the national electricity grid by addressing the risks to security of supply.

6.5.3.5 Tourism and Recreation

Given the established site use, it is not expected that the proposed development will result in significant impacts on tourism or the existing recreational facilities in the area during the operational phase. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year.

Neutral / imperceptible impacts on marine tourism in the Shannon estuary.

6.5.3.6 Community Facilities and Amenities

Due to the location of the site, significant impacts on community facilities and amenities are unlikely during the operational phase. Moneypoint will continue to engage with the local

community including community social and sporting initiatives. Neutral / imperceptible impacts on community facilities and amenities.

6.5.3.7 Human Health

The proposed development will continue to operate in accordance with the requirements of the Industrial Emissions Licence. The proposed development has been subject to a Technical Land Use Planning (TLUP) Assessment in accordance with the HSA guidance. Copies of the assessment report accompany this planning application (Appendix D of EIAR). The report concludes that the risk of a major accident at the ESB Moneypoint site as a result of the proposed development is acceptably low with respect to the Land-use Planning criteria. The TLUP also notes that it is considered unlikely that human health would be significantly affected, directly or indirectly, in an event of HFO spill.

The air quality and the dust impacts on human health during operation and maintenance phase are assessed in Section 7.5.2 of Chapter 7 Air Quality.

The noise impacts due to operation and maintenance of proposed development are assessed in Section 9.5.3 in Chapter 9 Noise and Vibration.

The impacts on water quality in the area and risk of flooding due to proposed development are assessed in Chapter 11 Surface Water Resources and Flooding.

Significant adverse impacts on human health during the operation and maintenance phase are not likely.

6.5.4 Decommissioning Phase

The proposed development, as described within Chapter 4 of this report, will contribute to the security of energy supply in Ireland for five years until end of 2029. It is envisioned that on decommissioning some of the structures on site may be used for future developments such as those which may be linked to the Green Atlantic @ Moneypoint project which is in the early design and feasibility study stages.

6.6 Cumulative Effects

6.6.1 Other Projects / Developments

It is anticipated that any cumulative effects with other developments in the area will be slight-moderate and of temporary duration during construction. Prior to commencement of construction and during the construction phase ESB will engage with the proponents of these developments and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and potential impacts on population and human health are minimised.

6.7 Mitigation Measures and Monitoring

Construction activities have the potential to create a nuisance and cause disruption. All work will be carried out having regard to international and national legislation, and best practice guidance, as detailed in the topic specific chapters of this EIAR.

A Construction Environmental Management Plan (CEMP) is included in Appendix C of this EIAR. The CEMP will be implemented during the construction phase to safeguard the environment, site personnel, and nearby receptors, i.e. occupiers of residential and commercial properties, from site activities which may cause harm or nuisance.

The appointed contractors (in collaboration with ESB) will be required to maintain close liaison with local community representatives and statutory consultees throughout the construction period. This is likely to include circulation of information about ongoing activities; particularly those that could potentially cause disturbance. A telephone number will be provided and persons with appropriate authority to respond to calls and resolve or escalate any problems arising will be available. All construction activities will be managed through the site CEMP and TMP. There are no specific mitigation measures proposed to ameliorate impacts on population and human health in addition to the measures specified elsewhere in this EIAR.

During the operational phase there will be no significant adverse impacts on population and human health as a result of the proposed development and hence no mitigation and monitoring measures are proposed.

6.8 Residual Impacts

The proposed development will not result in significant adverse long-term residual impacts on population and human health, given the scale and nature of the proposals. A positive effect for the population will be the generation of electricity to meet the demand on the national electricity grid and the security of supply needs.

7 Air Quality

7.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on local air quality.

The assessment of air quality has been carried out in accordance with national requirements and best practice, including Environmental Protection Agency *Air Dispersion Modelling from Industrial Installations Guidance Note* (EPA AG4)[31] and addresses the construction and operational impacts resulting from emissions to air.

The proposed development will consist of the transition of the existing coal fired power station's primary fuel to Heavy Fuel Oil (HFO). Electricity generation currently occurs within three identical 300MWe rated boiler units (hereafter referred to as existing boilers) giving a total electricity generating capacity of 900MWe. The proposed development will utilise one new 22.7 MWth input diesel fired auxiliary boiler to generate steam for the purpose of heating the HFO and assisting with start-up.

Technical Amendment A, issued on 23 April 2021, makes provision for an auxiliary boiler designated as 'A3-07'. This emission point will be removed from the IE Licence as part of the proposed transition to HFO as the primary fuel and has not been considered further.

Further description of the proposed development is provided in Chapter 4 of this EIAR.

The assessment considers the effects of the proposed development at sensitive receptor locations, both human health and ecological, by considering the existing baseline and incremental impacts of the proposed development to determine future predicted pollutant concentrations. Whilst the assessment also considers and quantifies the plants historical emissions from coal operation, the assessment determines significance of effects on air quality on human and ecological receptors based on HFO firing and its impacts upon the existing baseline only. This allows the air quality impacts of HFO to be assessed and considered on its own merits, however it should be noted that there are some benefits to operating on HFO compared to the historical coal operation and this has been considered when assessing impacts on designated sites.

The air quality assessment includes:

- Identification of key pollutants;
- Identification of applicable legislation and emission limits;
- Quantification of emission rates and evaluation with reference to relevant emission limits;
- Assessment of existing air quality conditions in the study area;
- Assessment of construction effects;
- Dispersion modelling of key pollutant releases from the proposed development in isolation and cumulatively with the consented 'Temporary Emergency Generation Power Plant' (TEGP) at the Tarbert Power Station;
- Evaluation of the dispersion modelling results with reference to relevant air quality criteria; and

[31] Environmental Protection Agency Office of Environmental Enforcement (2020), 'Air Dispersion Modelling from Industrial Installation Guidance Note (AG4) available at Technical Report template, embedded Dublin (epa.ie) [last accessed August 2023]

- Identification of mitigation measures for both construction and operation phases where necessary.

7.1.1 Key Pollutants

The combustion of fossil fuel gives rise to a number of pollutants hazardous to human health and/or ecology with the potential to negatively affect local air quality.

7.1.1.1 Existing Main Boilers

With respect to combusting Heavy Fuel Oil (HFO) within the existing boilers and ammonia slip for the Selective Catalytic Reduction (SCR), the primary pollutants of concern are:

- Oxides of nitrogen (NOx)
- Carbon monoxide (CO)
- Sulphur dioxide (SO_2)
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Ammonia (NH_3)
- Other parameters monitored on a periodic basis in accordance with Condition 6, and listed in Schedule C, of the IE licence include hydrogen chloride, hydrogen fluoride, sulphur trioxide and a range of metals and metalloids. As the IE licence does not set emission limit values for these pollutants they are not considered further in this assessment.

7.1.1.2 Oxides of Nitrogen

Oxides of nitrogen (NOx) is a term commonly used to describe a mixture of nitric oxide (NO) and nitrogen dioxide (NO_2), referred to collectively as NOx. These are primarily formed from atmospheric and fuel nitrogen as a result of high temperature combustion. The major sources in most countries are road traffic and power generation.

During the process of combustion, atmospheric and fuel nitrogen is partially oxidised via a series of complex reactions to NO. The process is dependent on the temperature, pressure, oxygen concentration and residence time of the combustion gases in the combustion zone.

Most NOx exhausting from a combustion process is in the form of NO, which is a colourless and tasteless gas. It is readily oxidised to NO_2, a more harmful form of NOx, by chemical reaction with ozone and other chemicals in the atmosphere.

7.1.1.3 Carbon Monoxide

Carbon monoxide (CO) is a colourless, odourless gas produced by the incomplete combustion of carbon-based fuels, such as HFO and diesel. The major source of carbon monoxide is traffic, particularly in urban areas. CO is produced under conditions of inefficient combustion, is rapidly dispersed away from the source and is relatively inert over the timescales relevant for its dispersion. CO has always been present as a minor constituent of the atmosphere, chiefly as a product of volcanic activity but also from natural and man-made fires and the burning of fossil fuels.

7.1.1.4 Sulphur Dioxide

Sulphur dioxide (SO_2) is a colourless, non-flammable gas with an odour that irritates the eyes and air passages. It reacts on the surface of a variety of airborne solid particles, is soluble in water and can be oxidised within airborne water droplets. The most common sources of SO_2 include fossil fuel combustion, smelting, manufacture of sulphuric acid, conversion of wood pulp to paper, incineration of waste and production of elemental sulphur.

7.1.1.5 Particulate Matter

Particulate matter (PM) is a complex mixture of organic and inorganic substances present in the atmosphere. Sources are numerous and include power plants, other industrial processes, road transport, domestic coal burning and trans-boundary pollution. Secondary particulates, in the form of aerosols, attrition of natural materials and, in coastal areas, the constituents of sea spray, are significant contributors to the overall atmospheric loading of particulates. In urban areas, road traffic is generally the greatest source of fine particulate matter although localised effects are also associated with construction and demolition activity.

7.1.1.6 Ammonia

Ammonia (NH_3) is normally encountered as a gas and is found in small quantities in the atmosphere, being produced from the putrefaction of nitrogenous animal and vegetable matter. In sufficient concentrations, airborne NH_3 can result in direct toxic effects on vegetation. Further, the subsequent deposition of nitrogen compounds can lead to the acidification and nutrient enrichment of land and water. Over time, this may not only hinder the growth, abundance and distribution of plants, and especially, bryophytes and lichens, but can also prompt the growth of ruderal species or algal blooms which can lead to changes in the structure and function of qualifying or supporting habitats.

7.1.1.7 Proposed Auxiliary Boiler

The proposed development also includes a Gasoil/diesel fired auxiliary boiler. The primary pollutant of concern from diesel combustion is NOx.

Considering the fuel type and size of the auxiliary boiler, emissions of SO_2, PM and CO are expected to be low. This is supported by the Medium Combustion Plant Directive[32] (MCPD) as it does not specify emissions limits when combusting diesel (referred to as gas oil in the MCPD) in new boilers. Therefore, it is inferred that the absence of emission limit values in the MCPD means that these pollutants do not need to be considered.

7.1.1.8 Sulphur Dioxide

SO_2 emissions data generated for the proposed development based on combustion of a 'typical' diesel, likely to be supplied to the proposed development equates to a de minimus emission rate in grams per second for SO_2 and is three orders of magnitude lower than the diesel NOx emission rate for the auxiliary boiler and five orders of magnitude lower than the HFO operation SO_2 emission rate for the combined three existing boiler units.

Given the resulting de minimis SO_2 mass emission rate based on the likely sulphur content of diesel and the baseline SO_2 concentrations in the area are also low (see Section 7.4.2), operation of the auxiliary boiler would therefore be unlikely to result in significant impacts with respect to SO_2.

7.1.1.9 Particulate Matter

Emissions of particulate matter (PM) from boilers consists of a range of compounds and non-combustible elements and are primarily dependant on the type and grade of fuel fired in the boiler. When combusting distillate oil, such as diesel, PM is primarily dependant on the volume of sulphur and ash within the fuel and therefore the quality of the fuel supplied. As discussed above, the sulphur content of a 'typical' diesel supplied to the proposed development would likely contain a very low sulphur content. The level of ash in a 'typical' diesel is also expected to

[32] European Union. (November 2015), 'Directive (EU) 2015/2193 if the European Parliament and the council of 25 November 2015 on the limitation of emission of certain pollutants into the air from medium combustion plants'

be very low and would have a de minimis contribution to PM mass emissions relative to the existing boilers firing on HFO and have not been considered further.

Given the resulting de minimis PM mass emission rate due to the fuel type and the baseline PM_{10} concentrations in the area are low (see Section 7.4.2), operation of the auxiliary boiler would therefore be unlikely to result in significant impacts with respect to PM and have not been considered further.

7.1.1.10 Carbon Monoxide

CO emissions are primarily a result of incomplete combustion, due to the carbon in the fuel not fully oxidising to carbon dioxide. Higher emissions of CO are typically associated with older boilers which were not designed to achieve low CO levels due to poor burner design or improper maintenance. New boilers, such as the proposed auxiliary boiler, are designed to reduce carbon monoxide and improve fuel efficiency through improved burning design, maintenance schedules. The reduction of CO is in the operator's best interest lower CO emissions equates to improved fuel efficiency leading to lower running costs.

Given that the proposed development will utilise a new boiler and that the baseline CO concentrations in the area are low (see Section 7.4.2), operation of the auxiliary boiler would be unlikely to result in significant impacts with respect to CO and have not been considered further.

7.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Legislation, policies and guidance documents of potential relevance to air quality are set out in this section.

These legislation, policy and guidance documents have been used to inform this chapter of the EIAR.

7.2.1 Legislation

7.2.1.1 Operational Air Emissions

The existing development consists of three 300MWe boilers, each of these will be converted to operate continuously on HFO and will discharge emissions through the two existing stacks (two units through one stack and the third unit through a second stack.

As the proposed development's thermal input is greater than 50MW, the emissions limits specified under Chapter III of the Industrial Emissions Directive[33] (IED) and the associated 'BAT-AELs' within the Best Available Techniques (BAT) Reference Document for Large Combustion Plants[34] would apply.

Moneypoint Generating Station has a current Industrial Emissions (IE) Licence (Register Number P0605-04) containing emissions limit values (ELVs) for NOx, SO_2, dust and NH_3 and does not distinguish between coal or HFO firing. Given that the primary fuel will be changing from coal to HFO, it is expected that the 'BAT-AELs' contained within the Best Available Techniques (BAT) Reference Document for Large Combustion Plants would apply to the proposed development.

[33] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

[34] European Commissions (2017) Best Available Techniques (BAT) Reference Document for Large Combustion Plants

As discussed above, the proposed development also consists of one 22.7MWth input diesel fired auxiliary boiler. As the auxiliary boilers thermal input is between 1MW and 50MW, the auxiliary boiler would be required to meet the emissions limits specified under than Medium Combustion Plant Directive[35] (MCPD).

The BAT-AELs for coal operation have also been presented in Table 7.1 for comparison with existing ELVs and the HFO BAT-AELs, along with the MCPD ELVs for the proposed auxiliary boiler.

Table 7.1: Applicable Emissions Limits

Pollutant	Emission limit value (mg/Nm^3)[(a)]					
	Existing boilers					Proposed auxiliary boiler
	Coal primary / HFO backup	Coal BAT-AELs		HFO BAT-AELs		Diesel
	Licensed (annual)	Annual	Daily	Annual	Daily	
Oxides of nitrogen (NOx as NO_2)	200	150	200	110	145	200[(b)]
Oxides of sulphur (SOx as SO_2)	200	130	200	110	175	-
Carbon monoxide (CO)	-	140	-	100	-	-
Dust (PM)	20	12	20	10	15	-
NH_3	10	10		10	-	-

Notes: [(a)] Reference conditions: dry, 0°C, 1.013 kPa atm, 3% O_2 (liquid fuel), 6% O_2 (solid fuel)

[(b)] ELVs specified in the MCPD do not include an averaging period. Therefore MCPD ELVs apply to all ambient standards.

'-' denotes no ELV or BAT-AEL available.

The existing IE licence does not specify ELVs for CO.

The MCPD does not specify ELVs for SO_2, CO or dust. NH_3 would not be released from the auxiliary boiler as it is associated with SCR abatement on the existing boilers.

IE licence P0605 also requires the monitoring of emission to air of hydrogen chloride, hydrogen fluoride mercury for coal firing only and sulphur trioxide and a range of metals and metalloids. The IE licence does not set emission limit values for these pollutants.

7.2.1.2 Ambient Air Quality

Directive 2008/50/EC[36] on ambient air quality and cleaner air for Europe (EU Ambient Air Quality Directive) was adopted in May 2008 and consolidates previous air quality directives (apart from the Fourth Daughter Directive). This Directive sets out a range of mandatory Limit Values (LVs) for different pollutants and times by which they are to be achieved for the purpose of protecting human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants.

[35] European Union. (November 2015), 'Directive (EU) 2015/2193 if the European Parliament and the council of 25 November 2015 on the limitation of emission of certain pollutants into the air from medium combustion plants'

[36] European Union. (April 2008), 'Directive on Ambient Air Quality and cleaner Air for Europe', Directive 2008/50/EC Official Journal, vol. 152, pp. 0001-0044.

The Air Quality Standards Regulations[37] implement the EU Ambient Air Quality Directive (2008/50/EC) and define the air quality standards currently applicable in Republic of Ireland.

Table 7.2 presents the air quality standards and target values for the pollutants relevant to this assessment as prescribed by the EU and Irish legislation, hereafter referred to as air quality standards (AQS). Standards for the protection of vegetation and ecosystems are referred to as 'critical levels'.

Table 7.2: Statutory Ambient Air Quality Standards

Pollutant	Averaging period	AQS / Critical Level (µg/m³)	Allowance
For the protection of human health			
Nitrogen dioxide (NO_2)	1-hour	200	18 times pcy
	Annual	40	–
Carbon monoxide (CO)	8-hour rolling	10,000	–
Sulphur dioxide (SO_2)	1-hour	350	24 times pcy
	24-hour	125	3 times pcy
Particulate Matter (PM_{10})	24-hour	50	35 times pcy
	Annual	40	
Particulate Matter ($PM_{2.5}$)	Annual	20	
Critical level for the protection of vegetation and ecosystems			
Nitrogen oxides (NO_X)	Annual	30	–
Sulphur dioxide (SO_2)	Annual	20	–

Source: Directive 2008/50/EC

Notes: pcy = per calendar year

Directive 2008/50/EC and Air Quality Standards Regulations sets out that the limit values apply everywhere with the exception of:

- any locations situated within areas where members of the public do not have access and there is no fixed habitation;
- in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply;
- on the carriageway of roads; and
- on the central reservations of roads except where there is normally pedestrian access to the central reservation.

The areas where the AQS and limit values for the protection of vegetation apply are as follows:

- More than 20 kilometres from an agglomeration (i.e. an area with a population of more than 250,000); and
- More than 5 kilometres away from other built-up areas, industrial installation or motorways or major roads with traffic counts of more than 50,000 vehicles per day

Therefore, designated ecological sites within these areas do not have the benefit of protection from statutory air quality limit values. However, in accordance with Environment Protection Agency 'Air Dispersion Modelling from Industrial Installations Guidance Note (EPA AG4)[31] (2020) they have been included within this assessment.

[37] Air Quality Standards Regulations 2022 (S.I. No. 739/2022)

7.2.2 Polices

7.2.2.1 National Planning Policy

National Planning Framework

The National Planning Framework (NPF) was published in 2018 and is the Government's high-level strategic plan for shaping the future growth and development of Ireland up to the year 2040. With regard to air quality, there is one National Policy Objective (NPO) of relevance (NPO 64), which is primarily aimed at transport and building improvement measures rather than energy generation.

This policy objective states:

'Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.'

7.2.2.2 Regional Planning Policy

Spatial and Economic Strategy for the Southern Region

This Regional Spatial and Economic Strategy (RSES)[38], prepared by the Southern Regional Assembly, is a strategic plan and investment framework to shape future growth and to better manage regional planning. The policy of relevance to air quality within the strategy is the Regional Policy Objective (RPO) 130 'Air Quality'. This policy objective states:

2 It is an objective to:

a. Improve and maintain good air quality and help prevent harmful effects on human health and the environment in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions and promotion of measures that improve air quality including provision and management of green areas and vegetation;

b. Support local data collection in the development of air quality monitoring and to investigate the merits of creating a regional air quality and greenhouse gas emissions inventory"

7.2.2.3 Local Policy

Clare County Development Plan

The Clare County Development Plan 2023-2029 was adopted in March 2023. The County Development Plan sets out the overall strategy for the proper planning and sustainable development of the County up to 2029 and provides policies and objectives which will be used for determining planning applications.

A final adopted Clare County Development Plan 2023-2029 is currently being prepared and graphically designed. In the interim period, an Interim Version of the adopted Clare County Development Plan 2023-2029 has been prepared and is available online[39].

[38] Southern Regional Assembly (2020). Regional Spatial and Economic Strategy for the Southern Region, available at https://emra.ie/dubh/wp-content/uploads/2020/05/EMRA_RSES_1.4.5web.pdf f [last accessed August 2023]

[39] Clare County Development Plan 2023-2029, available at volume-1-written-statement-clare-county-development-plan-2023-2029-51406.pdf (clarecoco.ie)

The policy of relevance to air quality in this assessment is CDP11.41. Policy CDP11.41 states that:

It is an objective of Clare County Council:

a) To achieve and maintain good air quality and help prevent harmful effects on human health and the environment in our urban and rural areas;

b) To support local data collection in the development of air quality monitoring; and

c) To implement the provisions of national policy and air pollution legislation, in conjunction with other agencies as appropriate.

7.2.3 Guidance

The assessment is undertaken in accordance with best practice guidance, namely:

- Air Dispersion Modelling from Industrial Installations Guidance Note (EPA AG4) (Environmental Protection Agency, 2020)[40]
- Air Quality Assessment of Proposed National Roads – Standard (PE-ENV-01107) (Transport Infrastructure Ireland, 2022)[41]
- Land-Use Planning and Development Control: Planning for Air Quality (Environmental Protection UK and Institute of Air Quality Management, 2017)[42]
- Guidance on the assessment of dust from demolition and construction (Institute of Air Quality Management, 2023)[43]

7.3 Methodology

7.3.1 Approach to Data Collection

The following information and data sources (Table 7.3) have been considered during the production of this EIAR.

Table 7.3: Data Sources used to inform the Air Quality chapter of this EIAR

Data source	Date	Data contents
Met Eireann Meteorological Database (available at https://www.met.ie)	Various	Meteorological data
EPA publications (available at https://www.epa.ie/publications/monitoring--assessment/air/)	Various	EPA monitoring site data
Ireland ecological site boundaries (available at https://data.gov.ie)	Various	SAC, SPA and pNHA site boundaries
Air Pollution Information System (available at www.apis.ac.uk)	Various	Critical loads and backgrounds for ecology
'Temporary Emergency Generation Power Plant, Tarbert Power Station report by AECOM	2023	Emissions parameters for future plant at Tarbert Power Station

[40] EPA (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) Available at https://www.epa.ie/publications/compliance--enforcement/air/air-guidance-notes/EPA-Air-Dispersion-Modelling-Guidance-Note-(AG4)-2020.pdf

[41] Transport Infrastructure Ireland (2022), 'Air Quality Assessment of Proposed National Roads – Standard (PE-ENV-01107) .

[42] Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'

[43] Institute of Air Quality Management (2023). 'Guidance on the assessment of dust from demolition and construction.'

Data source	Date	Data contents
European Commissions Best Available Techniques (BAT) Reference Document for Large Combustion Plants	2017	BAT-AELs
Commission Implementing Decision (EU) 2021/2326 of 30 November 2021 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants (notified under document C (2021) 8580)	2021	BAT conclusions
ESB	2021-2022	Continuous Emissions Monitoring System (CEMS) data for Moneypoint Power Station
Cochran Ltd 'ESB MP Aux Boiler ADMS input.xlsx'	2023	Emission parameters for diesel auxiliary boiler

7.3.2 Approach to Impact Assessment

7.3.2.1 Construction Phase

Dust Emissions

Construction activities can result in temporary effects from dust. Dust is a generic term which usually refers to particulate matter in the size range of 1-75 microns in diameter. The most common impacts from dust emissions are soiling and increased ambient PM_{10} concentrations. Dust can arise from numerous construction activities such as concrete batching, piling, wind erosion on material stockpiles and earth moving. It can be mechanically transported either via wind or through the movements of vehicles onto public highways (transport of debris on vehicle wheels or uncovered loads). Although construction activities will be relatively limited given the type of development, effects have been scoped in to develop a suitable level of mitigation.

The dust-generating activities associated with the construction phase of the proposed development are concurrent with the existing and ongoing operation and maintenance phase dust-generation activities, such as ash handling. Due to the phasing of the proposed development, it is not appropriate to undertake a typical construction dust risk assessment as described in the IAQM Guidance (2023). Instead, the potential for impacts from dust-generating activities for the construction and operation and maintenance phases have been considered qualitatively and in relation to existing dust deposition monitoring in Section 7.5.1. Notwithstanding the above, best practice dust control measures taken from IAQM Guidance (2023) are presented in Section 7.7 consistent with an assumed 'High' risk level for dust impacts.

Construction Site Plant and Machinery Emissions

Construction requires the use of different equipment such as excavator, cranes and on-site generators. All construction plant have an energy demand with some resulting in direct emission to air from exhausts. Guidance from the IAQM notes that effects from exhausts will likely not be significant. Given the nature of the site plant, effects of plant emissions on local air quality are considered of negligible significance compared to industrial sources such as the proposed development's operation. Construction plant emissions have therefore not been assessed further in this chapter. However, mitigation measures to reduce the impacts on local air quality are presented in Section 7.7.

Construction Road Traffic Emissions

The TII guidance *Air Quality Assessment of Proposed National Roads – Standard* advises that where construction activities are programmed to last less than six months they are unlikely to constitute a significant air quality effect and can be scoped out of assessment. Where

construction activities are programmed to be longer than 6 months and would change traffic flows by more than the following, the assessment of traffic emissions should be undertaken.

- 1000 AADT[44]
- 200 Heavy Duty Vehicles (HDV) [45] expressed as an AADT
- 10 kilometres per hour (kph) expressed as a daily average speed
- 20 kph expressed as a peak hour speed

If none of the above criteria are met then the effects of construction traffic on air quality are considered to be not significant.

Environmental Protection UK (EPUK) and IAQM guidance (2017) provides a more general approach to planning and is not road scheme specific. The EPUK and IAQM guidance indicates that an assessment of traffic emissions is only likely to be required for large, long term construction sites that will generate an additional annual average flow of greater than 100 Heavy Duty Vehicles ((HDVs) greater than 3.5 tonnes) per day or greater than 500 Light Duty Vehicles[46] ((LDVs) less than 3.5 tonnes) per day.

The greatest predicted number of construction traffic movements in each construction year, as presented in Chapter 15 Traffic and Transport, are an

- average of 92 LDV daily movements (184 two-way) in 2025
- average of 16 HGV daily movements (32 two-way) in 2024

Peak construction traffic movements have also been assessed in Chapter 15 Traffic and Transport. During the peak construction period there is anticipated to be an increase in total vehicles movements of 407 two-way movements per day of which are 140 two-way HGV movements on the N68 between Ennis and Kilrush and fewer on the N67 between Moneypoint and Kilrush.

The construction of the proposed development both in isolation and cumulatively is therefore unlikely to exceed the criteria provided by TII or the EPUK and IAQM. On this basis, no further considerations have been given to the effects of construction road traffic on ambient air quality.

7.3.2.2 Operational Phase – Road Traffic Emissions

The approach for operational road traffic emissions is consistent with the approach for construction road traffic emissions presented in Section 7.3.2.1.

Considering the following, it is unlikely that either the LDV or the HDV flows will exceed the TII or IAQM thresholds at any point during the operational phase.

- The operation of proposed development is unlikely to change the number of operational staff travelling to and from the application site;
- HFO deliveries will be via Marine Oil Tanker and off loaded at the existing oil Jetty using the existing infrastructure; and
- Diesel will continue be delivered by road tanker as per the current operational procedures.

On this basis, no further considerations have been given to the effects of operational road traffic on ambient air quality.

[44] Annual average daily traffic

[45] HDVs are vehicles greater than 3.5 tonnes and include buses and coaches

[46] HDVs are vehicles less than 3.5 tonnes and include light goods vehicles such as van and private passenger vehicles (cars).

7.3.2.3 Operational Phase – Energy Generation Emissions

Coal and HFO Mass Emissions

A comparison of the annual mass emissions from coal firing and HFO for the existing boilers and diesel firing for the auxiliary boiler has been presented in Table 7.4.

The annual mass emissions, based on 8760 hours of operation (all hours of the year), for the three existing boiler units have been calculated based on the existing IE licence maximum hourly normalised[47] volumetric flow rates and the existing permitted emission limits for coal and the annual BAT-AELs for HFO presented in Section 7.2.1.1.

The annual mass emissions for the proposed auxiliary boiler have been calculated based on the normalised volumetric flow rate and MCPD emission limits presented in Section 7.2.1.1. The volumetric flow rate for the proposed auxiliary boiler has been calculated based on manufacturer emissions specifications. However, as the final choice of manufacturer for the auxiliary boiler plant is not yet confirmed, the normalised volumetric flow and therefore mass emission rate have been increased by 10% to account for a measure of uncertainty relating to emissions.

The annual mass emissions presented in Table 7.4 provide a worst comparison as, during normal operation, the volumetric flow rates and emissions concentrations are likely to be lower than their licenced maximums and the future operation would not require the concurrent use of the existing boilers and the proposed auxiliary boiler. However, the calculation provides the basis for a worst case comparison of annual mass emissions.

As presented in Table 7.4, the annual mass emissions for the proposed development HFO operation will be up to 50% lower than those for the existing operation with coal when accounting for emission limits specified in the existing IE licence. Similarly, annual mass emission will be up to 40% lower when comparing the existing operation with coal against the updated coal BAT-AELs which would be applicable in the future without the conversion to HFO. On this basis, the dispersion modelling assessment presented in the sections below focuses on the future operation of the existing boilers on HFO only which represents an improvement over the current operation of Moneypoint Generating Station.

Further information relating to the air quality impacts associated with Moneypoint Generating Station's coal operation was undertaken in a dispersion modelling assessment in 2020 and is available to view on the EPA website[48].

Table 7.4: Mass emissions comparison between existing coal and future HFO firing

Parameter	Unit	Existing operation – IE licence	Existing operation – BAT-AELs	Proposed development	
Plant	-	Three existing boilers	Three existing boilers	Three existing boilers	One proposed auxiliary boiler
Fuel	-	Coal	Coal	HFO	Diesel
Emission limit	-	Existing IE licence	Annual BAT-AEL	Annual BAT-AEL	MCPD
Normalised volumetric flow	Nm^3/hr	1200000	1200000	1200000	25911

[47] Reference conditions: dry, 0°C, 1.013 kPa atm, 3% O_2 (liquid fuel), 6% O_2 (solid fuel))

[48] AWN consulting (2020), Air dispersion modelling assessment of a proposed auxiliary boiler for Moneypoint power station, County Clare available at https://epawebapp.epa.ie/licences/lic_eDMS/090151b2807b2031.pdf [last accessed 22/09/2023]

Parameter	Unit	Existing operation – IE licence	Existing operation – BAT-AELs	Proposed development	
NOx emission concentration	mg/Nm^3	200	150	110	200
SO_2 emission concentration	mg/Nm^3	200	130	110	-
Dust emission concentration	mg/Nm^3	20	12	10	-
NH_3 emission concentration	mg/Nm^3	10	10	10	-
CO emission concentration	mg/Nm^3	-	140	100	-
NOx mass emission	t/a	2102	1577 (25%) [(a)]	1156 (45%) [(a)]	45
SO_2 mass emission	t/a	2102	1367 (35%) [(a)]	1156 (45%) [(a)]	-
Dust mass emission	t/a	210	126 (40%) [(a)]	105 (50%) [(a)]	-
NH_3 mass emission	t/a	105	105	105	-
CO mass emission	t/a	-	1472	1051	-

Note: '-' indicates that no emission limits apply. Emissions of SO_2, dust and CO from the proposed auxiliary boiler would be de minimis when compared to the existing boilers. There would be no emissions of NH_3 from the proposed auxiliary boiler as SCR is not required to achieve the MCPD emission limit.

[(a)] Percentages in brackets show the reduction in mass emissions when compared to the 'Existing operation - IE licence' mass emissions

Model Selection

A number of commercially available dispersion models are able to predict ground level concentrations arising from emissions to atmosphere from elevated point sources such as a power plant. A new generation dispersion model, AERMOD (executable version 22112), was used to inform the basis of the air quality assessment.

AERMOD was developed for the US Environment Protection Agency and designed to treat both surface and elevated sources in simple and complex terrain. Special features of AERMOD include its ability to treat the vertical heterogeneity nature of the planetary boundary layer, special treatment of surface releases, irregularly-shaped area sources and limitation of vertical mixing in the stable boundary layer.

AERMOD is a modelling system with four separate components:

- AERMOD (AERMIC Dispersion Model);
- AERMAP (AERMOD Terrain Pre-processor); and
- AERMET (AERMOD Meteorological Pre-processor).
- AERSURFACE (AERMET surface parameters Pre-processor)

AERMAP is a terrain pre-processor designed to simplify and standardise the input of terrain data for AERMOD. Input data include receptor terrain elevation data. For each receptor, the output includes a location and height scale, which is an elevation used for the computation of air-flow around hills.

AERMET is the meteorological pre-processor for AERMOD. Input data can come from hourly cloud cover observations, surface meteorological observations and twice-a-day upper air soundings. Output includes surface meteorological observations and parameters and vertical profiles of several atmospheric parameters.

The AERSURFACE utility obtains the required surface parameters (albedo, Bowen ratio and surface roughness) by importing land cover datasets of surface characteristics that vary by land cover type and season to obtain realistic and reproducible surface characteristic values for use in AERMET.

Model Scenarios – Proposed development

The proposed development would convert the existing boilers from using coal as the primary fuel to HFO and would maintain the existing generating capacity of 900MWe. There is currently no limit on the number of operational hours for the existing boilers when firing on coal, however to provide a viable commercial solution for the extended running of Moneypoint, EirGrid and ESB are agreed on a Targeted Contracting Mechanism (TCM) for the provision of security of supply generation, for an average of 3000 hours per unit per year on HFO[49]. However, the dispersion modelling accounts for the combustion plant included in the scenarios below operating all year (8760 hours) to provide a worst case assessment.

During operation of the proposed development, a single existing boiler unit would provide sufficient heat for operational purposes to negate the heat demand from the proposed auxiliary boiler. The following two scenarios have been included in the dispersion modelling to provide a robust, worst case assessment of impacts:

- Scenario 1
  - Three existing identical 300MWe rated boiler units operating on HFO at full load, all year (8760 hours), with exhaust gas released through the two existing 220m stacks.
  - The proposed auxiliary boiler is not included in this scenario as there is no additional heat demand as auxiliary steam is provided by other units.
- Scenario 2
  - Two existing identical 300MWe rated boiler units operating on HFO at full load, all year (8760 hours), with exhaust gas released through the two existing 220m stacks.
  - One proposed 22.7MWth input auxiliary boiler operating on diesel at full load, all year (8760 hours), with exhaust gas released through a new 30m stack.

Model Scenarios – Cumulative

EPA AG4 guidance provides an approach for determining if an assessment of cumulative impacts on air quality is required and states that:

'The "impact area" for the cumulative assessment is defined as a 'circular area with a radius extending from the source to the most distance point where dispersion modelling predicts a "significant" ambient impact (i.e. >5% of an AQS) will occur irrespective of pockets of insignificant impact occurring within it. Within this impact area, all nearby sources should be modelled, where "nearby" is defined as any point source expected to cause a significant concentration gradient in the vicinity of the proposed new installation.'

The cumulative scenario considers the proposed development in addition to consented Tarbert Emergency Generation Power Plant (TEGP).

[49] Total run hours across the three units would be 9000 hours. When distributed evenly results in 3000 hours per year per unit. However, each boiler unit would be able to run for up to 5000 hours per year providing the combined total run hours does not exceed 9000 hours.

The cumulative scenario considers the proposed development scenario which results in the maximum process contributions.

Stack Emission Parameters

Table 7.5 summarises the stack emission parameters assumed for the proposed development. The exit temperature, actual volumetric flow and exit velocity data for the existing boilers firing on HFO are based on CEMS data from the Moneypoint Generating Plant, whilst emissions parameters for the auxiliary boiler firing on diesel has been in part provided by the plant manufacturers and calculated by Mott MacDonald.

Emission concentrations are based on BAT-AELs for the existing boilers and MCPD emissions limits for the auxiliary boiler. Where short term (daily) emission concentrations are available, their equivalent emission rates have been modelled for assessment against short term (1 hour and 24 hour) ambient AQS. Where short term emission concentrations are not available the annual emission rate has been included in the dispersion model for assessment against short term ambient AQS.

Table 7.5: Proposed Development Stack emission parameters

Parameter	Unit	Existing boiler (per unit)	Proposed Auxiliary boiler
Fuel	-	HFO	Diesel
Stack height	m	220	30
Stack location	WGS 1984, UTM Zone 29N	471333, 5828724 471999, 5828773	471136, 5828701
Stack internal diameter	m	6.89	1.15
Exit temperature	°C	80	265
Volumetric flow rate (Actual)	Am^3/s	825.6[(a)]	26.2[(b)]
Exit velocity	m/s	22.2[(e)]	25.2
Volumetric flow rate (Normal) [(c)]	Nm^3/s	333.3	7.2[(d)]
NOx emission concentration (Daily)	mg/Nm^3	145	200
NOx emission concentration (Annual)	mg/Nm^3	110	200
SO_2 emission concentration (Daily)	mg/Nm^3	175	-
SO_2 emission concentration (Annual)	mg/Nm^3	110	-
PM emission concentration (Daily)	mg/Nm^3	15	-
PM emission concentration (Annual)	mg/Nm^3	10	-
NH_3 emission concentration	mg/Nm^3	10	-
CO emission concentration	mg/Nm^3	100	-
NOx emission rate (daily)	g/s	48.3	1.4
NOx emission rate (annual)	g/s	36.7	1.4
SO_2 emission rate (daily)	g/s	58.3	-
SO_2 emission rate (annual)	g/s	36.7	-
PM emission rate (daily)	g/s	5.0	-
PM emission rate (annual)	g/s	3.3	-
NH_3 emission rate	g/s	3.3	-
CO emission rate	g/s	33.3	-

Source: ESB data, plant manufacturer information and calculations made by Mott MacDonald

Notes: Arithmetic discrepancies may occur due to rounding

(a) Actual conditions = 8.3% O_2, 80°C, 15.5% H_2O

(b) Actual conditions = 10.6% O_2, 265°C, 7.7% H_2O

(c) Reference conditions: dry, 0°C, 1.013 kPa atm, 3% O_2 (liquid fuel),

(d) As the final choice of manufacturer of the auxiliary boiler plant is not yet confirmed, the normalised volumetric flow and therefore mass emission rate have been increased by 10% to account for a measure of uncertainty relating to emissions.

(e) In scenario 1 the exit velocity for Unit 1 and Unit 2 combined is 44.4m/s

Table 7.6 presents the stack emission parameters for the consented TEGP[50] that have been incorporated into the cumulative assessments for the proposed development.

Table 7.6: Stack emission parameters for cumulative development

		TEGP
Parameter	**Unit**	**OCGT 1-3 (per unit)**
Fuel	-	Gas oil (diesel)
Stack Location	WGS 1984, UTM Zone 29N	474880, 5826598 474853, 5826609 474825, 5826622
Stack height	m	30
Stack diameter	m	4
Exit velocity	m/s	15
Volumetric flow rate (Actual)	Am^3/s	188.5
Exit temperature	°C	451.6
NOx emission concentration	mg/Nm^3 (15% O_2, dry)	90
CO emission concentration	mg/Nm^3 (15% O_2, dry)	100
PM emission concentration	mg/Nm^3 (15% O_2, dry)	17
SO_2 emission concentration	mg/Nm^3 (15% O_2, dry)	66
NOx emission rate	g/s	9.8[(a)]
CO emission rate	g/s	10.9[(a)]
PM emission rate	g/s	1.9[(a)]
SO_2 emission rate	g/s	7.2[(a)]
Operational profile	Hours per year	500

Source: Tarbert Emergency Generation Power Plant Environmental Report (2023)

Note: OCGT = Open Cycle Gas Turbine

[(a)] Emission parameter specified on a per unit basis; Due to uncertainty regarding the specific time of operation, emissions for plant with part time operational profiles have been prorated by applying an adjustment factor calculated by taking the number of operational hours divided by 8760 (ie 500/8760) and have been applied to the emission rates for comparison with annual AQS. However, for hourly averaging periods, the models have been run assuming the emission rates in the table above.

Arithmetic discrepancies may occur due to rounding.

[50] TEGP's planning application has been granted although the site does not yet have an IE Licence.

Modelled Buildings

The movement of air over and around buildings generates areas of flow circulation which can lead to increased ground level concentrations in the building wakes, a process known as downwash. AERMOD includes a building effects module, known as BPIP Prime, which is used to calculate the dispersion of pollution from sources near large structures. The buildings likely to have a dominant effect (i.e. with the greatest dimensions likely to promote turbulence) are presented in Table E.1 and Figure E.1, Appendix E.

The tallest buildings included in the dispersion model are the three boilers at 65m above ground level. As the existing stacks are 220m above ground level (over three times the height of the boiler unit buildings) building wake effects are unlikely to occur. However, as the auxiliary boiler stack is 30m above ground level wake effects are likely to affect the auxiliary boiler's plume causing it to ground close to the stack and therefore the highest process contributions are likely to occur onsite where the AQS do not apply.

Meteorological Data

The most important meteorological parameters governing the atmospheric dispersion of pollutants are wind direction, wind speed and atmospheric stability as described below:

- Wind direction determines the sector of the compass into which the plume is dispersed.
- Wind speed affects the distance the plume travels over time and can affect plume dispersion by increasing the initial dilution of pollutants and inhibiting plume rise.
- Atmospheric stability is a measure of the turbulence of the air, and particularly of its vertical motion. It therefore affects the spread of the plume as it travels away from the source. New generation dispersion models use a parameter known as the Monin-Obukhov length that, together with the wind speed, describes the stability of the atmosphere.

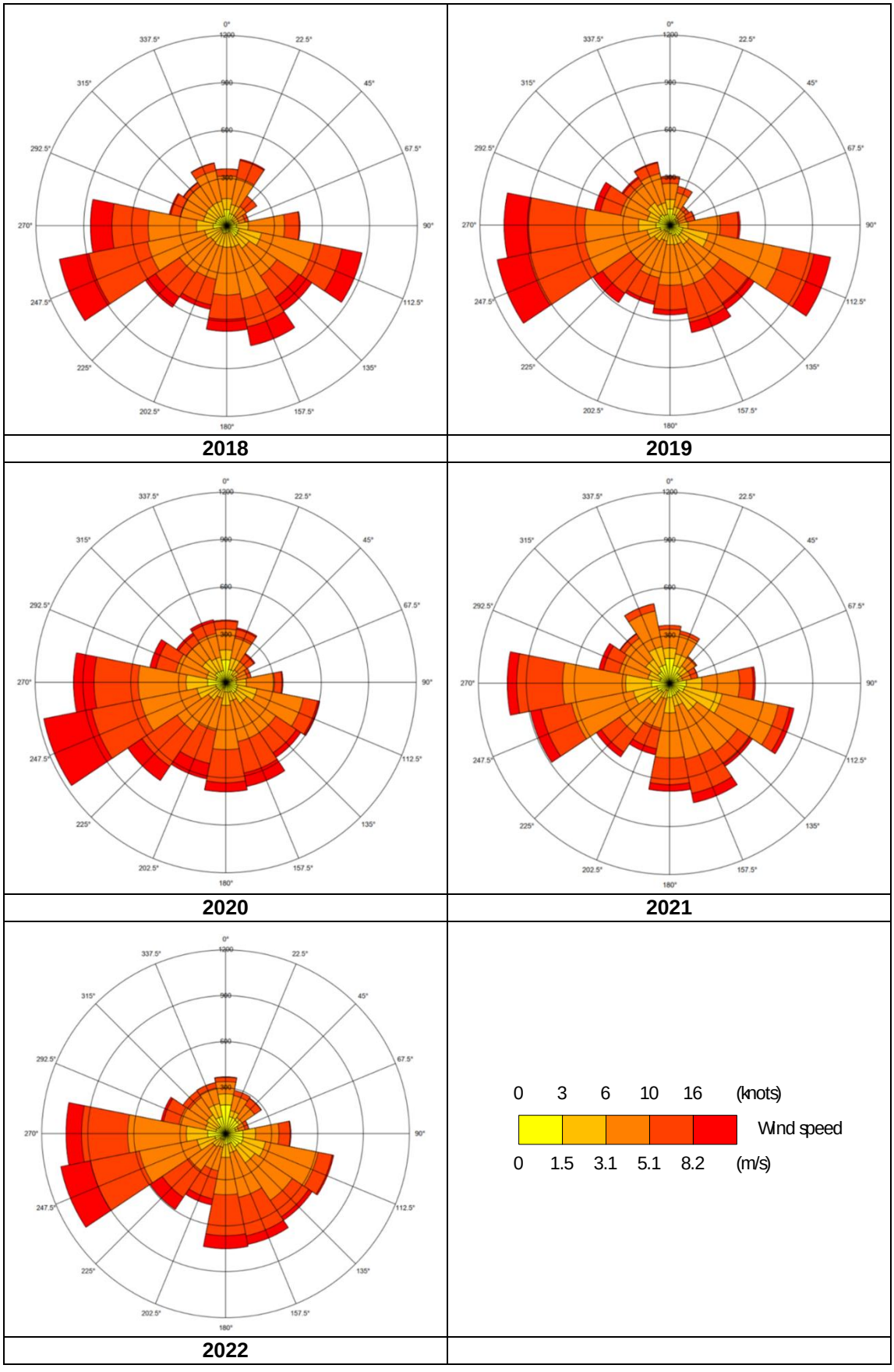
For meteorological data to be suitable for dispersion modelling purposes, a number of meteorological parameters need to be measured on an hourly basis. These parameters include wind speed, wind direction, cloud cover and temperature. There are only a limited number of sites where the required meteorological measurements are made.

The year of meteorological data that is used for a modelling assessment can have a significant effect on source contribution concentrations. For this assessment, dispersion model simulations were performed for emissions from the site using five years of data (2018 – 2022).

Meteorological data was sourced from Met Éireann and obtained from their monitoring site at Shannon Airport (approximately 35km east of the application site) as this was the meteorological site most representative due to similar land use and its proximity to the proposed development site.

Wind roses have been constructed for each of the five years of meteorological data used in this assessment. The wind roses presented in Figure 7.1 illustrate that in all five meteorological years there is a dominance of winds from the west and south east.

Figure 7.1: Wind Roses for Shannon Airport (2018 – 2022)



Terrain

The presence of elevated terrain can significantly affect (usually increase) ground level concentrations of pollutants emitted from elevated sources, such as stacks, by reducing the distance between the plume centre line and ground level. Terrain can also increase turbulence and, hence, plume mixing which can also reduce ground level concentrations. Terrain is usually included where gradients exceed 1 in 10m. Detailed terrain data with 30m horizontal resolution has been included in this assessment.

Surface Roughness

Different land use categories can affect dispersion and is measured using a parameter known as surface roughness length. The surface roughness length, along with albedo and Bowen ratio, within the study area has been calculated using AERSURFACE to import National Land Cover Database (NLCD 2016) data before being processed in AERMET.

Receptors

The dispersion modelling has been used to predict ground level pollutant concentrations at regular intervals across an inner 5km^2 grid with a 50m horizontal resolution, an intermediate 10km^2 grid with a 200m horizontal resolution and an outer 60km^2 grid with a 1000m horizontal resolution, centred on the proposed development site. Predicted concentrations have been compared against the relevant AQS for the protection of human health.

As discussed in Section 7.2, the AQS do not apply at

a) any locations situated within areas where members of the public do not have access and there is no fixed habitation
b) in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply

Therefore, this assessment has excluded predicted ground level concentrations within the ESB land ownership boundary presented in Figure 7.2.

The dispersion modelling has also been used to predict ground level pollutant concentrations at sensitive human health receptors closest to the proposed development. These locations assessed as ‘discrete receptors’ have been selected to represent the closest sensitive receptors to the site, which includes multiple residential receptors and the Burrane National School (HH13). Human health discrete receptors included in the model are presented in Table 7.7 and Figure 7.2.

There are 16 Natura 2000 sites, eight NHAs (Natural Heritage Areas) and 29 pNHAs (proposed Natural Heritage Areas) within a 30km radius of the proposed development site. A complete list of ecological designated sites considered within the assessment are presented in Table E.2, Appendix E and Figure 7.3: Ecological Receptors. Further details of the ecological designated sites are provided in Chapter 10 Biodiversity.

Table 7.7: Human Health Discrete Receptors Included in the Model

ID	Grid reference (WGS1984, UTM Zone 29N)	
	X	Y
HH1	472134	5828866
HH2	472244	5828851
HH3	472739	5829046
HH4	472171	5829414
HH5	471553	5829271
HH6	471120	5829373

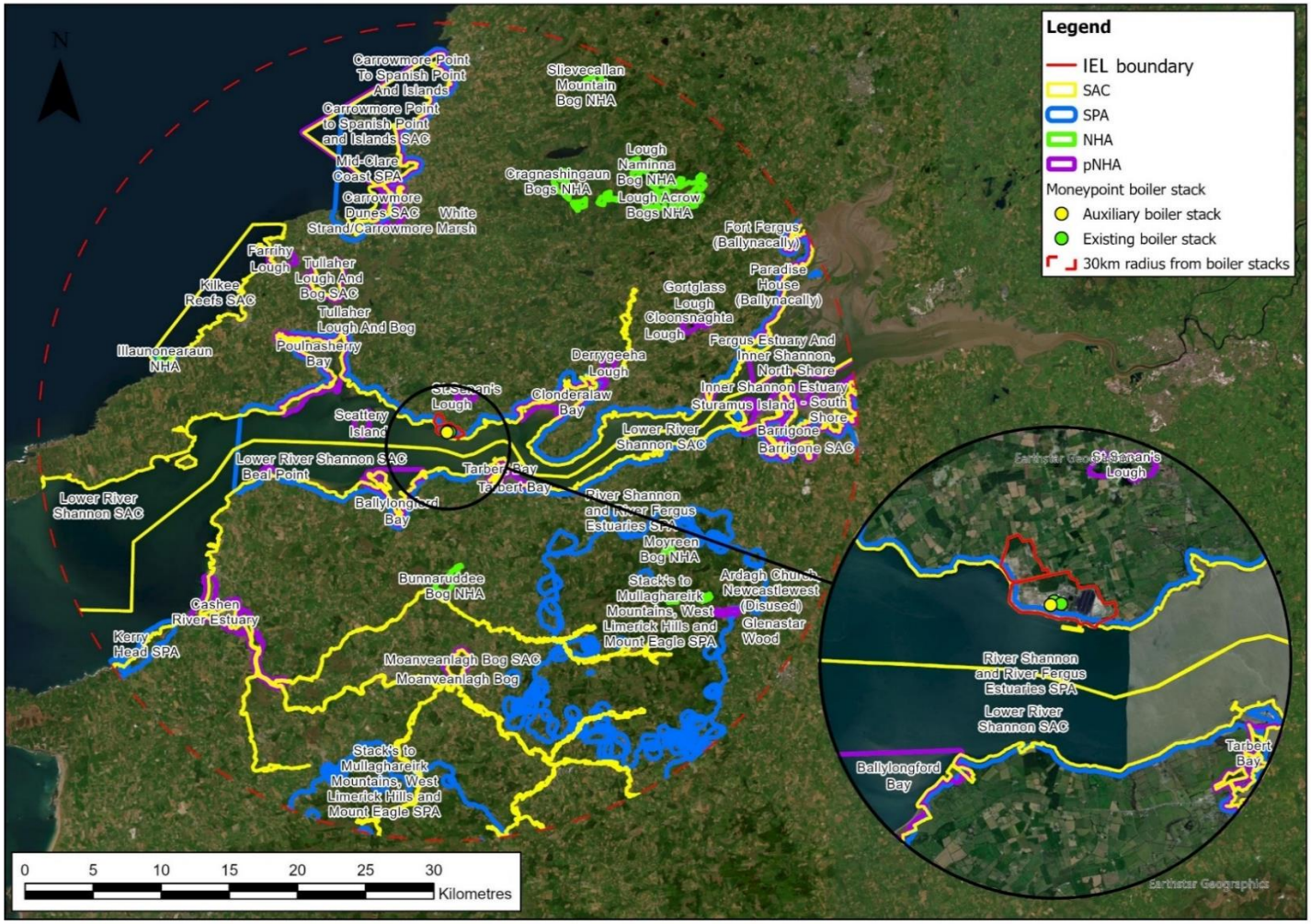
ID	Grid reference (WGS1984, UTM Zone 29N)	
	X	Y
HH7	470283	5829896
HH8	470209	5829644
HH9	469762	5829540
HH10	470970	5830105
HH11	471985	5825222
HH12	474932	5830761
HH13	475713	5830686
HH14	468540	5830610
HH15	467577	5831419
HH16	467123	5830991
HH17	467530	5831919
HH18	470970	5825408
HH19	474148	5825084
HH20	477335	5827680

Note: Human health receptors modelled at a height of 1.5m.
Grid references rounded to 0 decimal places.

Figure 7.2: Modelled Human Health Receptors

Source: ESB, Mott MacDonald (2024)

Figure 7.3: Ecological Receptors



Source: ESB, Mott MacDonald (2024)

NO_x to NO_2 Relationship

The NO_X emissions associated with combustion activities at the site will typically comprise approximately 90-95% nitrogen monoxide (NO) and 5-10% nitrogen dioxide (NO_2) at source. The NO oxidises in the atmosphere in the presence of sunlight, ozone and volatile organic compounds to form NO_2, which is the principal concern in terms of environmental health effects.

There are various techniques available for estimating the portion of the NO_X that is converted to NO_2, which increases with increasing distance from the source. EPA AG4 recommends that, where AERMOD has been used to predict ground level pollutant concentrations, detailed modelling of NO_2/NOx chemistry should also be undertaken.

AERMOD incorporates two options for modelling NO_2/NOx chemistry known as the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM). Both methods apply the same basic chemical mechanism for converting nitric oxide (NO) and Ozone (O_3) to NO_2 and oxygen (O_2). For dispersion modelling applications where there are isolated elevated point sources, PVMRM represents a more refined approach as it accounts for entrained O_3 along the plume.[51] The PVMRM is also recommended in AG4 as it has been shown to have better agreement with monitoring data than OLM. On this basis, the PVMRM method has been adopted for this assessment.

This modelling assessment has used the following input data for PVMRM:

- In-stack NO_2/NOx ratio
  - A ratio of 0.05 has been applied meaning that 5% of the NOx that leaves the stack is already in the form of NO_2. [52]
- Final equilibrium NO_2/NOx ratio
  - A ratio of 0.9 has been applied meaning that the final balance between NO and NO_2 will be 10% NO and 90% NO_2.[52]
- Background ozone (O_3) concentration
  - An ozone concentration of 73µg/m^3 has been used in this assessment and is taken from monitoring at Macehead for 2022. Macehead is a Zone D (rural Ireland) monitoring site located approximately 80km north of the proposed development and is representative of ozone concentrations likely to occur at the application site.

Assessment of Effects on Vegetation and Ecosystems

An assessment has been made of emissions from the proposed development with reference to critical levels and critical loads for the designated ecological sites within a 30 kilometre radius of the proposed development site.

Critical Levels – Atmospheric NOx

Critical levels for the protection of vegetation and ecosystems are specified within relevant European air quality directives and corresponding Irish air quality standards. For both European and national sites, process contributions and predicted environmental concentrations of NO_x have been calculated for comparison against the critical level. Background NO_x concentrations applied to each designated site are identified in Section 7.4.

Critical Loads – Nitrogen Deposition (Eutrophication) and Acidification

Critical loads are a quantitative estimate of exposure to deposition of one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge. Process contributions to nitrogen and acid deposition have

[51] MACTEC (2004) Sensitivity Analysis of PVMRM and OLM in AERMOD

[52] MACTEC (2005) Evaluation of Bias in AERMOD-PVMRM

been derived from dispersion modelling. Deposition rates were calculated using empirical methods within Habitats Directive Guidance (AQTAG.06)[53] as follows:

7. Calculate NO_2 dry deposition flux (0.0015 m/s for grassland, 0.003 m/s for forest assumed as deposition velocity):
8. Calculate NH_3 dry deposition flux (0.02 m/s for grassland, 0.03 m/s for forest assumed as deposition velocity):
9. Calculate SO_2 dry deposition flux (acid only) (0.012 m/s for grassland, 0.024 m/s for forest assumed as deposition velocity):
10. Dry deposition flux (µg/m^2/s) = ground level concentration (µg/m^3) x deposition velocity (m/s)
11. For nitrogen deposition
    a. convert units from µg/m^2/s to units of kg/ha/yr by multiplying the dry deposition flux by a standard conversion factor (95.9 for NO_2 for 260 for NH_3).
    b. Add predicted dry nitrogen deposition from NO_2 and NH_3 to get total nitrogen deposition process contribution (kg/ha/yr)
12. For acid deposition
    a. Convert dry deposition flux (µg/m^2/s) to units of equivalents (keq/ha/yr), which is a measure of how acidifying the chemical species can be, by multiplying the dry deposition flux (µg/m^2/s) by standard conversion factors (6.84 for NO_2, 18.5 for NH_3, 9.84 for SO_2).
    b. Add predicted dry acid deposition from NO_2, NH_3 and SO_2 to get total acid deposition process contribution (keq/ha/yr)

Wet deposition in the near field is not significant compared with dry deposition for N, and therefore for the purposes of this assessment, wet deposition has not been considered.

7.3.2.4 Assessing Significance

Proposed Development

A number of approaches can be used to determine whether the potential air quality effects of a development are significant. However, there remains no universally recognised definition of what constitutes 'significance'. Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of effects within an air quality assessment. It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively.

EPA AG4 does not define specific significance criteria for assessments of industrial emissions. However, where a facility is operated continuously at close to the maximum licenced mass emission rate the maximum allowable process contributions (MAPC) should be no more than 75% of the ambient air quality standard (AQS) and less than this where background concentrations (BC) account for a significant[54] proportion on the ambient air quality standard. The following formula from EPA AG4 has been used to assess significance of the proposed development:

- $\mathrm{MAPC} = 0.75 \times \mathrm{AQS}$

Furthermore, whilst EPA AG4 does not provide maximum allowable Predicted Environmental Concentration (PEC), it is understood that it is preferable if it can be demonstrated that the PEC can be demonstrated to be below 70% of the AQS.

[53] Air Quality Advisory Group, 2014, AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air.

[54] EPA AG4 does not define when a background concentration is significant.

Cumulative

The EPA AG4 guidance states that, where both the nearby existing and proposed installations are predicted to have impacts greater than 5% of the short or long term AQS which overlap with nearby emission sources, a cumulative assessment should be undertaken. The guidance then asks the following questions:

- Does cumulative modelling indicate an exceedance of the AQS in the region of overlap between the proposed installation (i.e. the proposed development) and other existing or proposed installations? If so, is the AQS exceeded in the absence of the proposed installation?
- Does the proposed installation (i.e. the proposed development) exceed 25% of an AQS, known as the Prevention of Significant Deterioration (PSD) increment, in the region of overlap between the proposed installation and other existing or proposed installations?

7.3.3 Study Area

The assessment of the operation phase will consider the impacts on air quality up to 30km from the proposed development. This is in accordance with the EPA AG4 guidance which states that the receptor grid should be large enough to ensure that the maximum ground-level concentration is captured.

7.4 Receiving Environment

7.4.1 Overview

Information on existing air quality in Ireland can be obtained from the EPA[55], who undertake monitoring at a number of locations across the country. For the purposes of air quality management, Ireland is divided into four zones:

- Zone A: Dublin conurbation
- Zone B: Cork conurbation
- Zone C: 23 large towns with population >15,000
- Zone D: Remainder (i.e. rural Ireland)

The proposed development is located within Zone D. In accordance with Irish EPA guidance (AG4), background data should be obtained from monitoring sites which are within the zone representative of the proposed development, in this case Zone D.

7.4.2 Baseline data

Data for Castlebar, Birr, Askeaton, Shannon Estuary and Tipperary Town has been obtained from the EPA data archive and is summarised in Table 7.8 to Table 7.11. Monitored concentrations are well below the respective air quality standards presented in Section 7.2.

Castlebar has been included as it the closest current monitor to the proposed development within Zone D that is representative of the modelled study area. Closer monitors within Zone D are considered to be influenced by road traffic rather than background. These include ‘Mallow’ adjacent to the N72 and ‘Birr’ adjacent to the N52.

Birr has been included as it is the closest current monitor the proposed development measuring CO. Whilst Birr is influenced by road traffic, being located adjacent to the N52, emissions of CO

[55] Environmental Protection Agency, Environment and You, Air – available at https://www.epa.ie/environment-and-you/air/

from road traffic are unlikely to significantly affect the background monitored concentration to the extent that it could jeopardise the robustness of this assessment.

Table 7.8: Annual Mean NOx and NO_2 Pollutant Concentrations

Site name	Coverage	Distance to proposed development (km)	Pollutant	Annual mean concentration (µg/m³)						
				2017	2018	2019	2020	2021	2022	Average
Castlebar	Suburban background	140	NO_x	11	11	11	9	11	11	11
Castlebar	Suburban background	140	NO_2	8	8	8	6	6	8	7

Source: EPA Data Archive
Note: Data capture above 90% in all years

Table 7.9: Annual Mean SO_2 Pollutant Concentrations

Site name	Coverage	Distance to proposed development (km)	Annual mean concentration (µg/m³)						
			2017	2018	2019	2020	2021	2022	Average
Askeaton	Rural background	30	-	2.6	1.8	1.6	1.6	6.3	2.8
Shannon Estuary	Rural background	32	2.3	-	-	-	-		-

Note: Data capture above 90% at all sites and years except for Askeaton highlighted in **Bold** where data capture was 4%
'-' indicates that the monitoring site had not yet been commissioned or has been decommissioned.

Table 7.10: Annual Mean PM_{10} and $PM_{2.5}$ Pollutant Concentrations

Site name	Coverage	Distance to proposed development (km)	Pollutant	Annual mean concentration (µg/m³)						
				2017	2018	2019	2020	2021	2022	Average
Askeaton	Rural background	30	PM_{10}	-	-	18	7 (25)	9 (69)	9	11
Tipperary Town	Suburban background	90	PM_{10}	-	-	9	12	13	14	12
Castlebar	Suburban background	140	PM_{10}	11	11	16	14	10	11	12
Askeaton	Rural background	30	$PM_{2.5}$	-	-	-	4 (25)	6 (77)	6	5
Tipperary Town	Suburban background	90	$PM_{2.5}$	-	-	6	8	9	9	8

Note: Where data capture is less than 90% it has been shown in parenthesis and highlighted in **bold**
'-' indicates that the monitoring site had not yet been commissioned or has been decommissioned.

Table 7.11: Annual Mean CO Pollutant Concentrations

Site name	Coverage	Distance to proposed development (km)	Annual mean concentration (µg/m^3)			
			2020	**2021**	**2022**	**Average**
Birr	Suburban traffic	115	400	300	800	500

Note: Data capture in 2020 was 45%, 2021 was 98%, 2022 was 96%
CO monitoring started in indicates that the monitoring site had not yet been commissioned or has been decommissioned.

7.4.3 Summary

EPA AG4 suggests that baseline concentrations should be averaged over the most recent two to three years available. The most recent published monitoring report data available is for 2022.

Baseline concentrations for NO_2 and NOx used in the assessment have been determined based on 2022.

Monitoring data is only available for SO_2 at Askeaton between 2018 and 2022 and data capture in 2019 is low. SO_2 was also monitored at the Shannon Estuary site in 2017, 5km north of the Askeaton monitor. The 2022 SO_2 concentration at Askeaton is approximately three times higher than in the preceding four years and is considered an outlier. An annual mean SO_2 concentration of 3µg/m^3 has been adopted for this assessment based on the average monitored annual mean SO_2 concentration of 2.8 µg/m^3 between 2018 and 2022. This is considered a conservative approach.

The highest recorded 2022 PM_{10} and $PM_{2.5}$ annual mean concentration of 14µg/m^3 and 9µg/m^3 have been adopted for this assessment.

Monitoring data for CO is not available at the Birr monitor prior to 2020 and as the data capture in 2020 is low, 2022 data has been adopted for this assessment for CO.

The UK Environment Agency guidance[56] suggests that short term (1 hour, 8 hour and 24 hour) background concentrations can be estimated by doubling the annual mean background concentrations. This process has been applied to background concentrations used for this assessment.

Baseline concentrations used in the assessment are summarised in Table 7.12.

Table 7.12: Baseline Concentrations used in the Assessment

Pollutant	Averaging period	Baseline concentration (µg/m^3)
NOx	Annual	11
NO_2	Annual	8
NO_2	Hourly	16
SO_2	Annual	3
SO_2	Hourly, Daily	6
PM_{10}	Annual	14
PM_{10}	Daily	28
$PM_{2.5}$	Annual	9
CO	8 hour rolling	1600

7.5 Likely Significant Impacts

7.5.1 Construction Phase

7.5.1.1 Dust impacts

As discussed in Section 7.3.2.1, the potential for impacts from dust-generating activities for the construction and operation and maintenance phases have been considered cumulatively and therefore presented under this construction phase section of the likely significant impacts. The key elements of the proposed development which have significant potential to generate dust

[56] Environment Agency (UK), Risk assessments for your environmental permit [https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit]

emissions are the partial dismantle of the coalyard equipment i.e. stack reclaimers and conveyors, the modification of the ASA to allow for additional FGD by-product storage, and continued landfill of ash and FGD by-product. Table 7.13 presents the key dust emitting activities associated with the proposed development.

Table 7.13: Dust Emitting Activities

Phase	Area	Activity	Description	Year
Construction	Coalyard	Partial coalyard dismantling including dismantling of coal handing plant and associated buildings	Partial dismantle of the coalyard will comprise the decommissioning and removal of key coal handling plant and the dismantle of associated structures to ground level. Chapter 4 provides further details on the partial coalyard dismantle.	2026 onwards
Construction	Construction of new structures	Construction of ● auxiliary boiler building ● 2 No. HFO tanks ● Ancillary buildings	The proposed development requires the construction of new structures. Associated earthworks including the excavation of soil and stone would have the potential to raise dust and would be controlled through dust control mitigation measures presented in Section 7.7 resulting in a low likelihood of adverse effects from dust emissions. The structures would be laid on a concrete foundation and be would be primarily metal construction with limited dust raising potential. Dust effects from the construction of new structures are not anticipated and have not been considered further.	2025
Operation and maintenance	Ash Storage Area	Modification of Ash Storage Area (ASA) including the continued landfill of ash	Increasing the thickness of the capping layer in the ASA from 0.6m to 1.6m. The capping material will be composed of a mixture blend of dry FGD by-product, fly ash reclaimed from the ASA and cement. This mixture will be levelled and compacted to form an improved capping solution to the ASA. The overall quantity of material proposed to be landfilled will be reduced considerably, estimated to be 495,132m^3. As discussed in Section 4.2.5 approximately 120 tonnes per week of fly ash will be required to be reclaimed for caping purposes in addition to the volumes used for bed stability. Recovered ash from the ASA will be placed into a lorry unloading hopper to the west of the batching plant.	2025-2029

The coalyard and ASA are existing operational sources of dust emissions which are being managed by existing dust control measures at the site. One such dust control measure is the long-term monitoring of dust deposition using mass deposition (Bergerhoff) gauges, at four locations surrounding the coalyard and four locations surrounding the Ash Storage Area. These monitoring locations are presented in Figure 7.4. This dust deposition monitoring is carried out at a monthly sampling interval and has been in place since September 1995. Dust deposition results from mass deposition gauges are usually compared with a ‘complaints likely’ dustfall guideline of 200mg/m^2/day derived by Vallack & Shillito[57]. The Industrial Emissions License[58]

[57] Vallack HW and Shilito DE (1998), Atmospheric Environment, Vol 32 (No.16) pp.2737-2744

[58] Industrial Emissions License, Moneypoint Generating Station, April 2021.

includes a dust deposition limit of 350 mg/m^2/day for these monitoring locations. Table 7.14 presents an analysis of historic dust deposition monitoring results.

Table 7.14: Analysis of historic dust deposition monitoring results

Threshold	Location	Number of months exceeding	Total monthly periods monitored	Percentage of months exceeding	Most recent exceedance
'Complaints likely' (200 mg/m^2/day)	Coalyard	22	319	6.9%	July 2012
	Ash Storage Area	4	319	1.3%	July 2011
Permitted (350 mg/m^2/day)	Coalyard	9	319	2.8%	December 2011
	Ash Storage Area	1	319	0.3%	July 2010

Source: ESB dust deposition monitoring results from September 1995 to current day

The dust deposition gauges are each located within the site boundary, with some monitors directly adjacent to the sources of dust emissions at the coalyard and ASA, whereas the nearest residential properties which are set back at least 10m from the site boundary. The rates of dust deposition at the nearest residential properties would therefore likely be lower than the monitored deposition rates. The results of this monitoring therefore indicate that particularly since 2012, there has been a low likelihood of adverse effects from dust emissions during the past operation of the coalyard and Ash Storage Area.

Figure 7.4: Dust monitoring locations and nearest receptors

The long-term monitoring of dust deposition at the ASA and coalyard show that dust emissions have been controlled effectively at the site. The coalyard will be partially demolished to allow enabling works for the Green Atlantic @ Moneypoint project and will no longer be in use, removing the potential for adverse effects from coal dust. However, there may be a potential for temporary adverse effects from dust during the partial dismantling of the coalyard plant and structures as part of the proposed development. Dust control measures to be implemented during dismantling of the coalyard are set out in Section 7.7.1.2. These are best practice dust control measures taken from the IAQM guidance (2023). With the implementation of these dust control measures, there would be no adverse effects from dust during the dismantling the coalyard and associated structures as part of this proposed development.

During the operation of the proposed development there would be a reduced volume of ash produced at the facility and stored in the ASA. However, ash will be continually reclaimed from the ASA to be incorporated in the FGD material, and the capping mixture of ash, FGD and cement will be laid down at a greater thickness, which are potential additional sources of operational dust emissions. Dust emissions from the ASA and landfill are currently controlled by the dust control measures set out in the Landfill Operational Plan[59]. With the continued application of these dust control measures, set out in Section 7.7.1.3, there would be no adverse effects from dust during the operation of the ASA and landfill.

[59] Landfill Operational Plan, Moneypoint Generating Station, April 2005.

7.5.2 Operation and Maintenance Phase

This section presents the operational effects identified from the dispersion modelling assessment for the proposed development.

The operational air quality effects of the proposed development operating in isolation for the following scenarios are presented below:

- Scenario 1
  - Three existing identical 300MWe rated boiler units operating on HFO at full load, all year, with exhaust gas released through the two existing 220m stacks.
  - The proposed auxiliary boiler is not included in this scenario as there would be no additional heat demand as auxiliary steam is provided by other units.
- Scenario 2
  - Two existing identical 300MWe rated boiler units operating on HFO at full load, all year, with exhaust gas released through the two existing 220m stacks.
  - One proposed 22.7MWth input auxiliary boiler operating on diesel at full load, all year, with exhaust gas released through a 30m stack.

As discussed above, emission concentrations are based on BAT-AELs for the existing boilers and MCPD emissions limits for the auxiliary boiler. Where short term (daily) emission concentration are available, their equivalent emission rates have been modelled for assessment against short term (1 hour and 24 hour) ambient AQS. Where short term emission concentrations are not available, the annual emission rate has been included in the dispersion model for assessment against short term ambient AQS.

The results of modelling atmospheric emissions from the proposed development at gridded, human health receptors and ecological receptors are summarised and interpreted below. The process contributions (PCs) and predicted environmental concentrations (PECs) have been compared against the air quality standards (AQS) and maximum allowable process contributions (MAPC)[60].

7.5.2.1 Human Health Receptors – Gridded

Table 7.15 and Table 7.16 present the proposed development's maximum predicted NO_2, SO_2, PM_{10}, $PM_{2.5}$ and CO concentrations for scenario 1 and 2 for comparison against the AQS. All predicted concentrations for these are taken from the maximum offsite gridded receptor location[61].

Baseline concentrations have been obtained from the EPA data archive, as summarised in Section 7.4.3.

The proposed development's process contribution (PC) is less than maximum allowable process contribution (MAPC) in both scenarios. Monitored baseline concentrations (BC) are low and the predicted environmental concentrations (PECs) do not exceed 70% of the AQS. Overall, the proposed development's modelled maximum PC and the PEC for both short and long term averaging periods are not likely to cause a significant effect.

The results show that impacts are marginally higher for Scenario 2 compared to Scenario 1. This is primarily due to the effects of the auxiliary boiler as its emissions are released via a 30m stack compared to the existing 220m stacks. In addition, when only one of unit 1 or unit 2 is

[60] MAPC are calculated using the formula MAPC = 0.75 x AQS

[61] Maximum offsite gridded receptor refers to the location within the model domain where the maximum concentration for each averaging period is predicted but excludes land occupied within the ESB land ownership boundary.

operational, the exhaust gas has a lower exit velocity compared to when both units are operating as they both feed into a common stack.

Table 7.17 presents a comparison of a previous air dispersion modelling assessment undertaken for the facility[62] with the modelled maximum results from scenario 2. The comparison has been made with scenario 2 as this scenario predicts larger ground level concentrations than scenario 1 and is comparative to the previous air quality assessment they both include an auxiliary boiler with a low stack height relative to the existing main boilers. This comparison demonstrates that the predicted modelled maximum NO_2 and SO_2 results for scenario 2 are lower than those predicted for the existing licenced operation and therefore impacts from the proposed operation would be less than the existing operation.

Table 7.15: Scenario 1: Modelled Maximum Results (µg/m^3)

Pollutant	Averaging Period	AQS	MAPC	PC	PC as % of MAPC	BC	PEC	PEC as % of AQS
NO_2	1 hour 99.79	200	150	8.7	5.8	16	24.7	12.4
	annual mean	40	30	0.3	1	8	8.3	20.7
SO_2	1 hour 99.73	350	263	15.8	6	6	21.8	6.2
	24 hour 99.18	125	94	4.4	4.7	6	10.4	8.3
PM_{10}	24 hour 90.41	50	38	0.2	0.5	28	28.2	56.4
	annual mean	40	30	<0.1	0.1	14	14	35
$PM_{2.5}$	annual mean	20	15	<0.1	0.2	9	9	45.2
CO	8 hour rolling	10000	7500	7.3	0.1	1600	1607.3	16.1

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO_2 the MAPC is calculated using the equation 40 x 0.75; PC: Process contribution (existing boilers); BC: Baseline concentration; PEC: Predicted environmental concentration

Table 7.16: Scenario 2: Modelled Maximum Results (µg/m^3)

Pollutant	Averaging Period	AQS	MAPC	PC	PC as % of MAPC	BC	PEC	PEC as % of AQS
NO_2	1 hour 99.79	200	150	17.3	11.5	16	33.3	16.6
	annual mean	40	30	0.7	2.5	8	8.7	21.9
SO_2	1 hour 99.73	350	263	12.8	4.9	6	18.8	5.4
	24 hour 99.18	125	94	3.9	4.2	6	9.9	7.9
PM_{10}	24 hour 90.41	50	38	0.2	0.4	28	28.2	56.4
	annual mean	40	30	<0.1	0.1	14	14	35
$PM_{2.5}$	annual mean	20	15	<0.1	0.2	9	9	45.2
CO	8 hour rolling	10000	7500	6.4	0.1	1600	1606.4	16.1

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO_2 the MAPC is calculated using the equation 40 x 0.75; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

[62] AWN (2020) 'Air dispersion modelling assessment of a proposed auxiliary boiler for MoneyPoint Power Station, County Clare' available at https://epawebapp.epa.ie/licences/lic_eDMS/090151b2807b2031.pdf

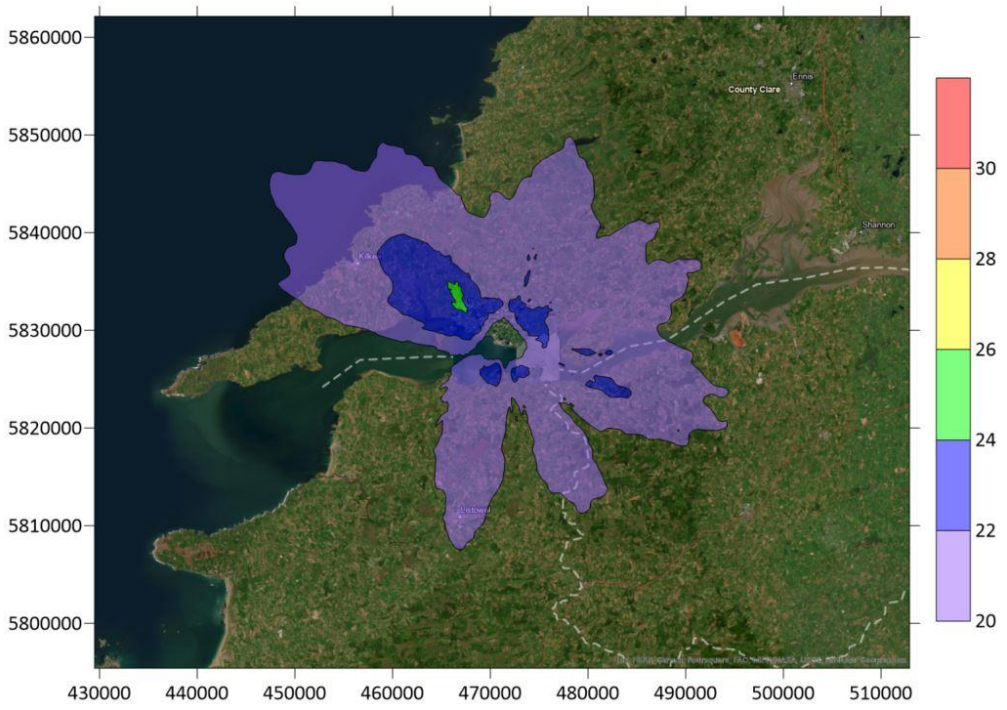
Table 7.17: Existing Versus Proposed NO_2 and SO_2 Modelled Maximum Results (µg/m^3)

Pollutant	Averaging Period	Existing[(a)] PC	Proposed[(b)] PC	Difference	Percentage difference
NO_2	1 hour 99.79	65.9	17.3	-48.6	-74
	annual mean	1.8	0.7	-1.1	-61
SO_2	1 hour 99.73	65.6	15.8	-49.8	-76
	24 hour 99.18	12.9	4.4	-8.5	-66

Notes: PC: Process contribution;
[(a)] 'Existing PC' includes the proposed scenario presented in an air dispersion modelling assessment undertaken for the facility in 2020 available at https://epawebapp.epa.ie/licences/lic_eDMS/090151b2807b2031.pdf
[(b)] 'Proposed PC' includes the results from Scenario 2 presented in Table 7.16 as these are the greater of scenario 1 and scenario 2

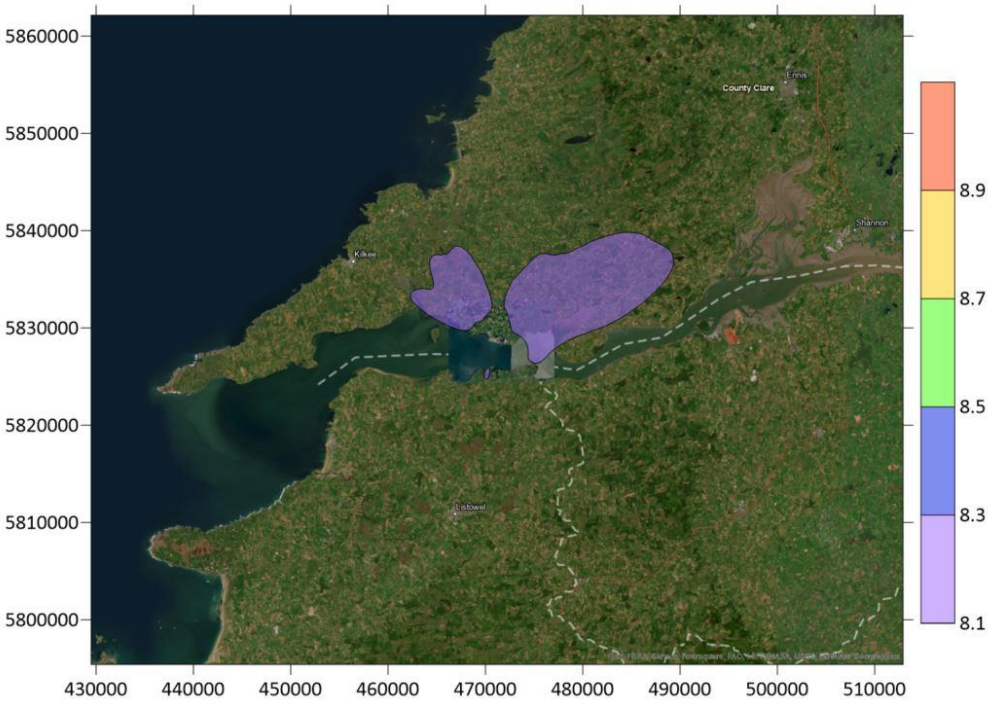
Figure 7.5 to Figure 7.12 present contour plots of the PECs for annual mean and hourly NO_2 and hourly and daily SO_2. Contour plots for PM and CO have not been presented given the low PCs of these pollutants.

Figure 7.5: Scenario 1 - 1-hour NO_2 99.79 percentile PEC (µg/m^3)



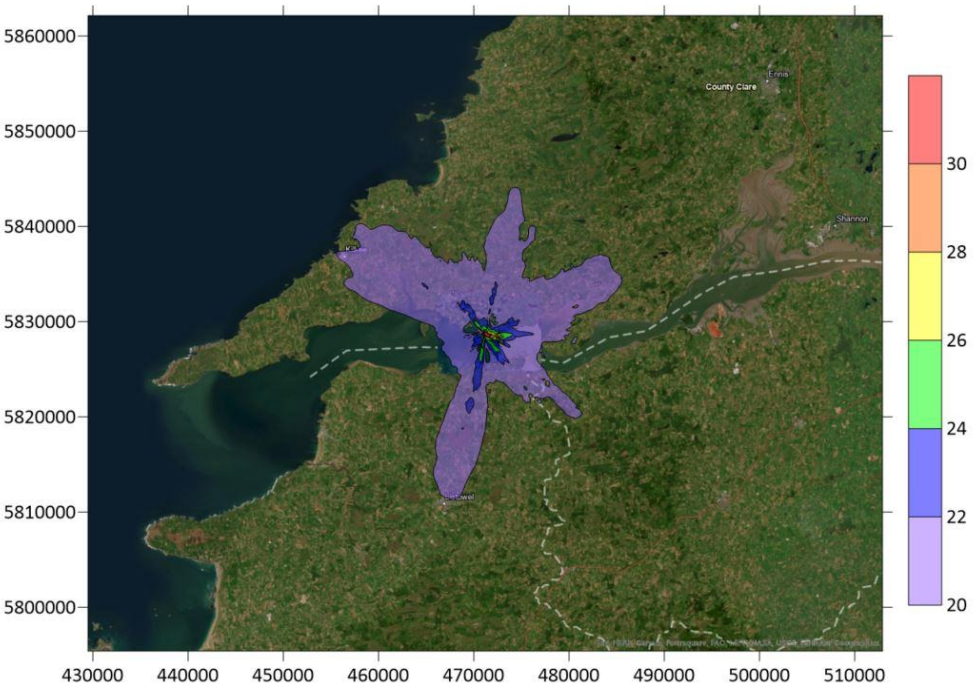
Notes: Minimum contour level: 20µg/m^3: Maximum contour level: 30µg/m^3; Contour interval 2µg/m^3, Meteorological year 2018, baseline NO_2 16µg/m^3, PEC = Predicted Environmental Concentration; AQS = 200µg/m^3

Figure 7.6: Scenario 1 - Annual mean NO_2 PEC (µg/m^3)



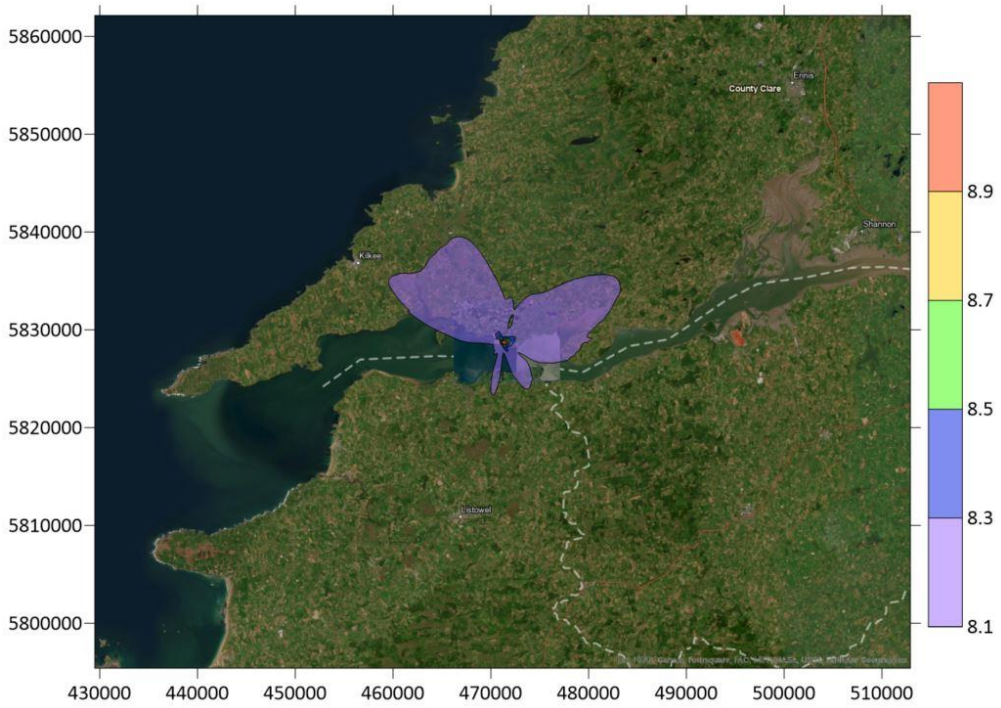
Notes: Minimum contour level: 8.1µg/m^3: Maximum contour level: 9.0µg/m^3; Contour interval 0.2µg/m^3, Meteorological year 2020, baseline NO_2 8µg/m^3, PEC = Predicted Environmental Concentration; AQS = 40µg/m^3

Figure 7.7: Scenario 2 - 1-hour NO_2 99.79 percentile PEC (µg/m^3)



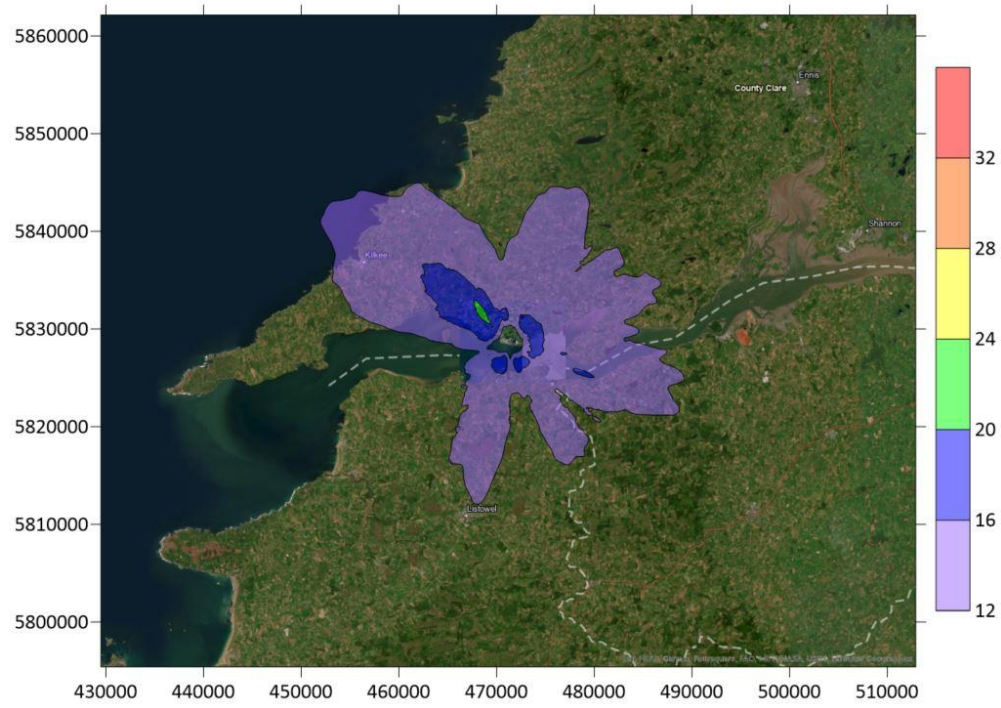
Notes: Minimum contour level: 20µg/m^3: Maximum contour level: 30µg/m^3; Contour interval 2µg/m^3, Meteorological year 2020, baseline NO_2 16µg/m^3, PEC = Predicted Environmental Concentration; AQS = 200µg/m^3

Figure 7.8: Scenario 2 - Annual mean NO_2 PEC (µg/m^3)



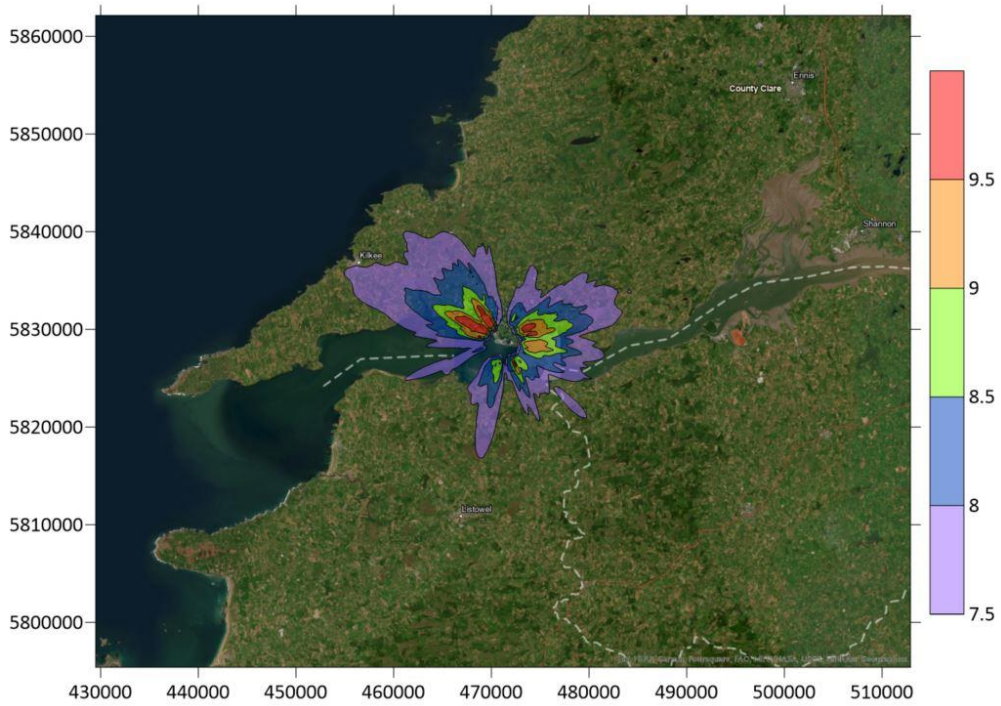
Notes: Minimum contour level: 8.1µg/m^3: Maximum contour level: 9.0µg/m^3; Contour interval 0.2µg/m^3, Meteorological year 2021, baseline NO_2 8µg/m^3, PEC = Predicted Environmental Concentration; AQS = 40µg/m^3

Figure 7.9: Scenario 1 - 1-hour SO_2 99.73 percentile PEC (µg/m^3)



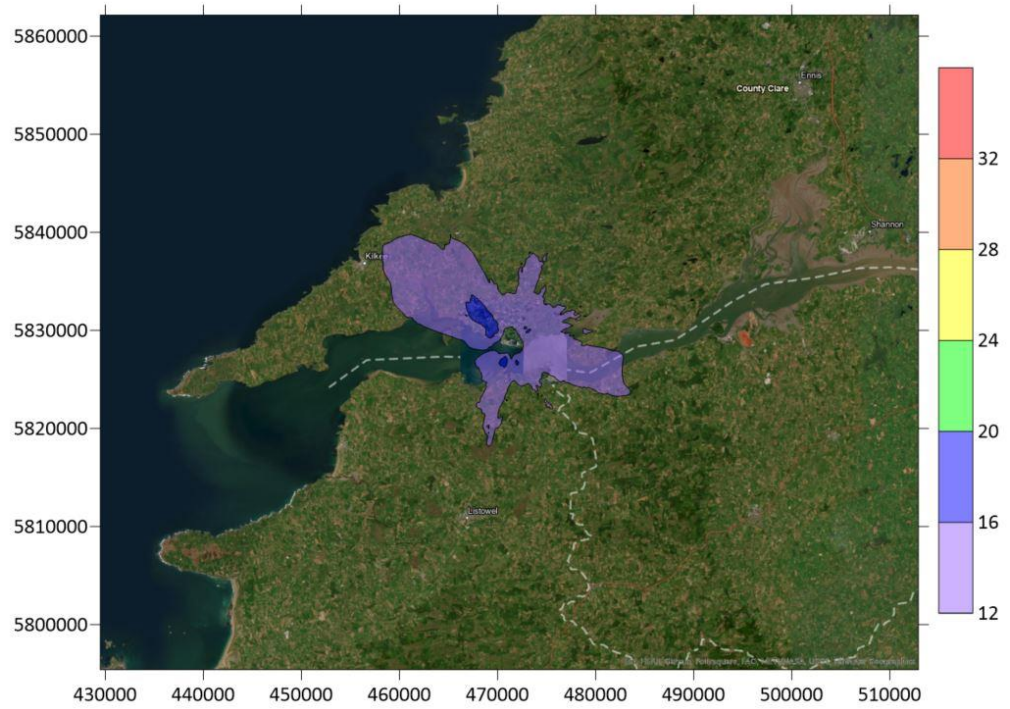
Notes: Minimum contour level: 12µg/m^3: Maximum contour level: 32µg/m^3; Contour interval 4µg/m^3, year 2018, baseline SO_2 6µg/m^3, PEC = Predicted Environmental Concentration; AQS = 350µg/m^3

Figure 7.10: Scenario 1 - 24-hour SO_2 99.18 percentile PEC (µg/m^3)



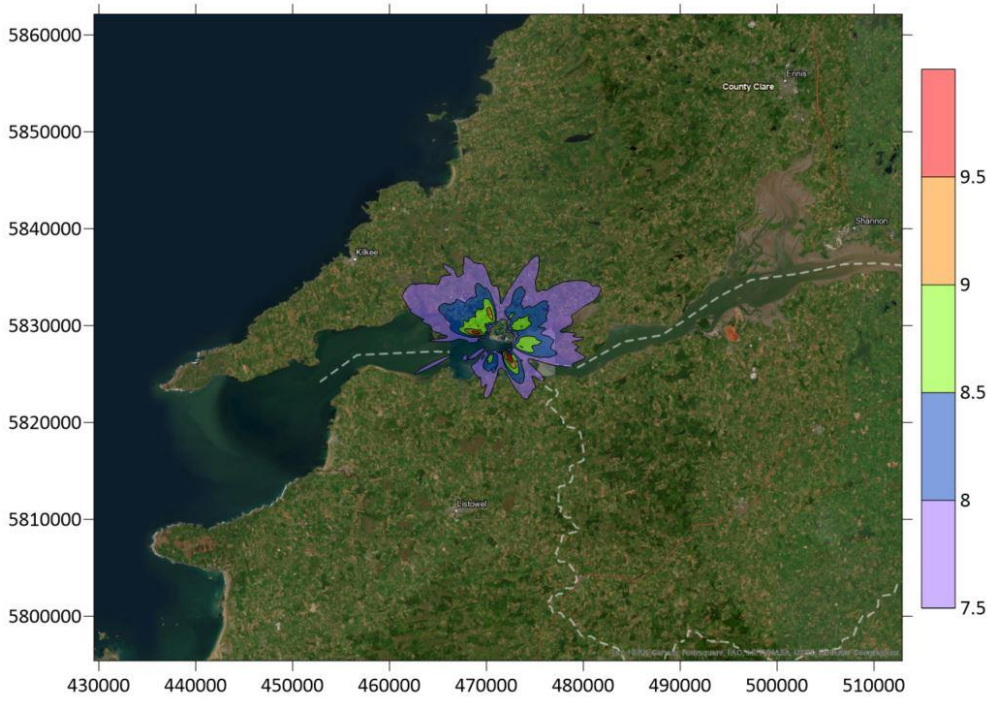
Notes: Minimum contour level: 7.5µg/m^3: Maximum contour level: 9.5µg/m^3; Contour interval 0.5µg/m^3, Meteorological year 2019, baseline SO_2 6µg/m^3, PEC = Predicted Environmental Concentration; AQS = 125µg/m^3

Figure 7.11: Scenario 2 - 1-hour SO_2 99.73 percentile PEC (µg/m^3)



Notes: Minimum contour level: 12µg/m^3: Maximum contour level: 32µg/m^3; Contour interval 4µg/m^3, year 2018, baseline SO_2 6µg/m^3, PEC = Predicted Environmental Concentration; AQS = 350µg/m^3

Figure 7.12: Scenario 2 - 24-hour SO_2 99.18 percentile PEC (µg/m^3)



Notes: Minimum contour level: 7.5µg/m^3: Maximum contour level: 9.5µg/m^3; Contour interval 0.5µg/m^3, Meteorological year 2021, baseline SO_2 6µg/m^3, PEC = Predicted Environmental Concentration; AQS = 125µg/m^3

7.5.2.2 Human Health Receptors – Discrete Receptors

Modelled pollutant concentrations at the modelled discrete receptor locations with the largest PC are presented in Table 7.18 and Table 7.19 for comparison with the MAPC and AQS. Table 7.20 presents the modelled discrete PCs for all modelled discrete receptors, pollutants and averaging periods.

The results presented in Table 7.18 and Table 7.19 show that, at all modelled discrete receptors, the PCs are below 7% of the MAPC and the resultant PECs are below 60% of the AQS.

Overall, the proposed development's modelled maximum PC and the PEC for both short and long term averaging periods are not likely to cause a significant effect.

Table 7.18: Scenario 1 - Results at Human Health Discrete Receptors with the largest PC (µg/m^3)

Receptor	Pollutant	Ave period	AQS	MAPC	PC	PC as % of MAPC	BC	PEC	PEC as % of AQS
HH17	NO_2	1 hour 99.79	200	150	8.0	5.3	16	24.0	12.0
HH12	NO_2	Annual mean	40	30	0.3	1.0	8	8.3	20.8
HH17	SO_2	1 hour 99.73	350	263	13.5	5.1	6	19.5	5.6
HH16	SO_2	24 hour 99.18	125	94	3.8	4.0	6	9.8	7.8

Receptor	Pollutant	Ave period	AQS	MAPC	PC	PC as % of MAPC	BC	PEC	PEC as % of AQS
HH12	PM_{10}	24 hour 90.41	50	38	0.2	0.5	28	28.2	56.4
All	PM_{10}	Annual mean	40	30	<0.1	<0.1	14	14.0	35.0
All	$PM_{2.5}$	Annual mean	20	15	<0.1	<0.1	9	9.0	45.0
HH7	CO	8 hour rolling	10000	7500	5.7	0.1	1600	1605.7	16.1

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO_2 the MAPC is calculated using the equation 40 x 0.75; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

Table 7.19: Scenario 2 - Results at Human Health Discrete Receptors with the largest PC (µg/m³)

Receptor	Pollutant	Ave period	AQS	MAPC	PC	PC as % of MAPC	BC	PEC	PEC as % of AQS
HH1	NO_2	1 hour 99.79	200	150	9.7	6.5	16	25.7	12.9
HH1	NO_2	Annual mean	40	30	0.4	1.3	8	8.4	21.0
HH17	SO_2	1 hour 99.73	350	263	11.5	4.4	6	17.5	5.0
HH16	SO_2	24 hour 99.18	125	94	3.1	3.3	6	9.1	7.3
HH3	PM_{10}	24 hour 90.41	50	38	0.1	0.3	28	28.1	56.2
All	PM_{10}	Annual mean	40	30	<0.1	<0.1	14	14.0	35.0
All	$PM_{2.5}$	Annual mean	20	15	<0.1	<0.1	9	9.0	45.0
HH9	CO	8 hour rolling	10000	7500	5.4	0.1	1600	1605.4	16.1

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO_2 the MAPC is calculated using the equation 40 x 0.75; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

Table 7.20: Process contributions (PCs) for Scenario 1 and Scenario Results at Human Health Discrete Receptors (µg/m^3)

Receptor	Scenario 1								Scenario 2							
	NO_2		SO_2		PM_{10}		$PM_{2.5}$	CO	NO_2		SO_2	PM_{10}	PM_{10}		$PM_{2.5}$	CO
	One hour 99.79	Annual	One hour 99.73	Daily 99.18	Daily 90.41	Annual	Annual	8 hour	One hour 99.79	Annual	One hour 99.73	Daily 99.18	Daily 90.41	Annual	Annual	8 hour
AQS	**200**	**40**	**350**	**125**	**50**	**40**	**20**	**10 000**	**200**	**40**	**350**	**125**	**50**	**40**	**20**	**10 000**
HH1	1.0	<0.1	2.5	1.1	<0.1	<0.1	<0.1	2.3	9.7	0.4	2.9	1.1	<0.1	<0.1	<0.1	2.5
HH2	1.3	<0.1	3.4	1.2	<0.1	<0.1	<0.1	2.6	9.0	0.4	3.8	1.2	<0.1	<0.1	<0.1	2.8
HH3	2.3	0.1	6.7	1.6	0.1	<0.1	<0.1	3.6	8.1	0.3	7.2	1.6	0.1	<0.1	<0.1	3.5
HH4	1.6	<0.1	5.0	1.6	<0.1	<0.1	<0.1	3.1	6.8	0.3	5.5	1.7	<0.1	<0.1	<0.1	3.4
HH5	0.5	<0.1	0.9	0.4	<0.1	<0.1	<0.1	1.4	9.7	0.4	1.1	0.4	<0.1	<0.1	<0.1	1.6
HH6	0.6	<0.1	1.1	0.6	<0.1	<0.1	<0.1	1.7	9.0	0.4	1.4	0.6	<0.1	<0.1	<0.1	1.9
HH7	2.5	<0.1	8.8	2.2	0.1	<0.1	<0.1	5.7	8.6	0.2	8.9	2.1	0.1	<0.1	<0.1	5.0
HH8	2.2	<0.1	8.4	2.0	<0.1	<0.1	<0.1	5.1	7.5	0.2	8.4	2.2	<0.1	<0.1	<0.1	5.1
HH9	3.6	0.1	10.2	2.8	0.1	<0.1	<0.1	5.5	5.7	0.2	9.9	2.8	0.1	<0.1	<0.1	5.4
HH10	2.1	<0.1	7.5	1.9	<0.1	<0.1	<0.1	4.3	7.3	0.2	7.8	1.6	<0.1	<0.1	<0.1	4.0
HH11	5.4	0.1	8.4	1.8	<0.1	<0.1	<0.1	3.9	5.2	0.1	7.2	1.6	<0.1	<0.1	<0.1	3.1
HH12	6.7	0.3	10.0	3.3	0.2	<0.1	<0.1	4.9	5.8	0.3	8.4	2.7	0.1	<0.1	<0.1	4.0
HH13	6.0	0.3	10.6	3.4	0.1	<0.1	<0.1	5.5	5.4	0.3	8.2	2.8	0.1	<0.1	<0.1	4.4
HH14	6.9	0.2	13.1	3.6	0.1	<0.1	<0.1	5.5	5.9	0.2	10.7	3.0	0.1	<0.1	<0.1	4.6
HH15	7.3	0.2	13.1	3.2	0.1	<0.1	<0.1	5.3	5.7	0.2	11.1	2.4	0.1	<0.1	<0.1	4.2
HH16	7.1	0.2	12.3	3.8	0.1	<0.1	<0.1	5.1	5.4	0.2	10.3	3.1	0.1	<0.1	<0.1	4.1
HH17	8.0	0.2	13.5	2.9	0.1	<0.1	<0.1	5.0	6.1	0.2	11.5	2.3	0.1	<0.1	<0.1	4.0
HH18	6.4	0.1	10.1	2.5	0.1	<0.1	<0.1	4.8	6.4	0.1	8.6	2.1	<0.1	<0.1	<0.1	3.9
HH19	5.7	0.1	8.2	2.3	<0.1	<0.1	<0.1	4.7	5.7	0.1	6.3	1.9	<0.1	<0.1	<0.1	3.9
HH20	5.4	0.1	9.0	2.6	0.1	<0.1	<0.1	5.4	4.4	0.1	9.0	2.6	0.1	<0.1	<0.1	5.4

7.5.2.3 Ecological Receptors – Critical Levels

Table E.3 and Table E.4, in Appendix E, present the predicted annual mean NOx and SO_2 PCs and PECs at the modelled ecological receptors, for comparison against the NOx and SO_2 standard for the protection of sensitive vegetation and ecosystems.

The maximum annual mean NOx PC is 0.4% of the AQS of for Scenario 1, and is located approximately 2.8km to the north east of the proposed development. For Scenario 2, the maximum PC is 4.1% of the AQS and is located approximately 250m to the south of the proposed development. Both locations are within the River Shannon and River Fergus Estuaries SPA. The maximum annual mean NOx PEC is 32.4% of the AQS for Scenario 1 and 35.5% of the AQS for Scenario 2.

The maximum annual mean SO_2 PC is 0.3% of the AQS of 20µg/m^3 for Scenario 1 and 0.3% of the AQS for Scenario 2 is also predicted at River Shannon and River Fergus Estuaries SPA. The maximum SO_2 PEC is 8.6% of the AQS for Scenario 1 and 8.7% of the AQS for Scenario 2.

The potential impacts on the ecological environment are assessed separately and presented in Chapter 10 Biodiversity of this EIAR which concludes that direct impacts from atmospheric NO_x and SO_2 are negligible. Overall, the PCs and PECs indicate that the increases in NO_x and SO_2 concentrations as a result of the proposed development are small relative to the background concentrations adopted for this assessment and would not result in exceedances of the AQS for NO_x or SO_2. On this basis, the direct impacts from atmospheric NO_x and SO_2 at ecological sites are negligible.

7.5.2.4 Ecological Receptors – Critical Loads (Nitrogen Deposition)

Contributions to nitrogen deposition (eutrophication) at each ecological site listed in Appendix E have been derived from the dispersion modelling and are summarised in Table E.5 and Table E.6 in Appendix E.3. The PCs are greater than 1% of the minimum nitrogen critical load applied to several habitat sites in this assessment and the PECs also exceed the critical load at several sites. Most notably the PCs and PECs at the saltmarsh habitats within Lower River Shannon SAC cannot be screened out as negligible relative to the APIS minimum critical load of 5kgN/ha/year, and the PCs and PECs for the raised and blanket bog habitat at Tullaher Lough And Bog SAC also cannot be screened out as negligible relative to the minimum APIS critical load of 5kgN/ha/year. Further assessment is provided within the biodiversity chapter of this EIAR. However, as outlined in Section 7.3.2.3, the annual mass emissions for the proposed development are lower than those for the existing operation on coal and the modelling for the proposed development has assumed continuous operation all year which is unlikely to occur due to the agreements in place. Therefore, the proposed development's contribution to nitrogen deposition would also be lower relative to the existing licenced operation. With a reduced contribution to levels of nitrogen deposition, there would be no adverse effects on designated habitat sites.

7.5.2.5 Ecological Receptors – Critical Loads (Acidification)

Contributions to nitrogen acid deposition at each ecological site have been derived from the dispersion modelling and are summarised in Table E.7 and Table E.8 in Appendix E.3. The PECs exceed the CLminN critical load at all the sites therefore the combined contributions to acid deposition from nitrogen and sulphur have been compared against the CLMaxN critical load. The PCs are greater than 1% of the minimum CLMaxN applied to several habitat sites in this assessment and the PECs also exceed the critical load at several sites. As such, there is the potential for adverse effects.

However, as outlined in Section 7.3.2.3, the annual mass emissions for the proposed development are lower than those for the existing operation on coal and the modelling for the

proposed development has assumed continuous operation all year which is unlikely to occur due to the agreements in place. Therefore, the proposed development's contribution to acid deposition would also be lower relative to the existing licenced operation. With a reduced contribution to levels of acid deposition, there would be no adverse effects on designated habitat sites.

7.6 Cumulative Effects

7.6.1 Construction Phase

The proposed development was assessed on its individual overlapping construction, operation and maintenance phase impacts and it was concluded in Section 7.5.1 that with the application of dust control measures, set out in Section 7.7, there would be no adverse effects from dust during the construction, operation and maintenance phase. It is unlikely that other development close to the application site would have the potential to raise substantial dust to the extent that they would cause cumulative effects at sensitive receptors. Therefore, it is concluded that there will be no significant cumulative impacts during the construction phase.

7.6.2 Operational Phase

As discussed in Section 7.3.2.3 ('Model Scenarios – Cumulative'), given the energy generation capacity of the proposed development and that of other developments close to the application site, a cumulative scenario has been modelled. The cumulative scenario has considered the impact of the proposed development in addition to the Tarbert Emergency Generation Plant (TEGP).

This assessment of cumulative impact is considered conservative as it assumes the proposed development and TEGP would operate simultaneously and would coincide with the worst meteorological conditions for short term impacts. For annual mean impacts, it also assumes the proposed development would operate continuously all year and TEGP for 500 hours. However, it would be expected that both plants would operate for fewer hours than assumed in the assessment.

7.6.2.1 Cumulative Criteria

EPA AG4 asks the following questions to define the significance of cumulative effects:

- **Question 1:** Does cumulative modelling indicate an exceedance of the AQS? If so, is the AQS exceeded in the absence of the proposed installation?
- **Question 2**: Does the proposed installation (i.e. the proposed development) exceed 25% of an AQS (known as the PSD increment) in the region of overlap[63] between the proposed installation and other existing or proposed installations?

The cumulative effects subsection below discusses the cumulative modelling results in the context of the above questions.

7.6.2.2 Cumulative Effects

Answer to Question 1

Table 7.21 and Table 7.22 present the maximum predicted cumulative process contributions (CPC) for comparison against the AQS for scenario 1 and scenario 2. All predicted

[63] The area of overlap refers to a circular area with a radius extending from the source to the most distant point where dispersion modelling predicts an ambient impact greater than 5% of an AQS.

concentrations for these averaging periods are taken from the maximum offsite gridded receptor location[64]. Short term CPC's are dominated by emissions from TEGP.

In both cumulative scenarios, none of the modelled pollutants are predicted to exceed AQS are at the maximum offsite gridded receptor location.

Answer to Question 2

In both scenario 1 and scenario 2, the proposed development operating in isolation does not exceed 25% of the MAPC or the AQS for any pollutant at any offsite location as demonstrated in Table 7.15 and Table 7.16 in Section 7.5.2.1.

Furthermore, as presented in Table 7.21 and Table 7.22, relative to the CPC and with the exception of annual mean NO_2, the maximum PC from the proposed development is minimal at the location of predicted maximum CPC.

For annual mean NO_2, the proposed development is the primary source of the CPC as emissions from the TEGP have been prorated to 500 hours per year. However, as discussed in Section 7.5.2.1, the annual mean NO_2 PC from the proposed development is well below the MAPC and does not cause any exceedance of the AQS and assumes continuous operation all year which is extremely conservative.

The proposed development is having a minimal cumulative contribution to the respective AQS in the region of overlap between proposed development and other installations.

Table 7.21: Scenario 1: Modelled Maximum Cumulative Results (µg/m^3)

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
NO_2	1 hour 99.79	200	5.6	45.3	30.2	16	61.3	30.7
	annual mean	40	0.3	0.3	1	8	8.3	20.8
SO_2	1 hour 99.73	350	8.6	57.4	21.9	6	63.4	18.1
	24 hour 99.18	125	2.3	19.3	20.6	6	25.3	20.2
PM_{10}	24 hour 90.41	50	0.1	1.7	4.5	28	29.7	59.4
	annual mean	40	<0.1	<0.1	0.1	14	14	35
$PM_{2.5}$	annual mean	20	<0.1	<0.1	0.3	9	9	45.2
CO	8 hour rolling	10000	4.9	95.3	1.3	1600	1695.3	17.0

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO_2 the MAPC is calculated using the equation 40 x 0.75; CPC: Cumulative Process Contributions (existing boilers); BC: Baseline concentration; PEC: Predicted environmental concentration

Table 7.22: Scenario 2: Modelled Maximum Cumulative Results (µg/m^3)

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
NO_2	1 hour 99.79	200	4.8	45.3	30.2	16	61.3	30.7
	annual mean	40	0.7	0.8	2.5	8	8.8	21.9
SO_2	1 hour 99.73	350	7.1	57.4	21.9	6	63.4	18.1
	24 hour 99.18	125	2.1	19.3	20.6	6	25.3	20.2

[64] Maximum offsite gridded receptor refers to the location within the model domain where the maximum concentration for each averaging period is predicted but excludes land occupied within the ESB land ownership boundary and Tarbert Power Station site boundary.

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
PM_{10}	24 hour 90.41	50	0.1	1.7	4.5	28	29.7	59.4
	annual mean	40	<0.1	<0.1	0.1	14	14	35
$PM_{2.5}$	annual mean	20	<0.1	<0.1	0.3	9	9	45.2
CO	8 hour rolling	10000	3.7	95.3	1.3	1600	1695.3	17.0

Notes: AQS: Air quality standard; CPC: Cumulative Process Contributions; BC: Baseline concentration; PEC: Predicted environmental concentration

7.7 Mitigation and Monitoring Measures

7.7.1 Mitigation Measures

7.7.1.1 Community Liaison

The Moneypoint Generating Station has an appointed community liaison that acts as a point of contact for the local community should any issues arise in the vicinity of the plant that require action from the operator. This role would continue during the proposed development construction, operation and maintenance phases.

7.7.1.2 Dust Control Measures to be Implemented during Dismantling of the Coalyard

Best practice mitigation measures to control the generation of dust during dismantling of the coalyard as outlined in the IAQM guidance are presented below.

Communications:

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issue on the Scheme boundary. This may be the environment manager/ engineer or the site manager;
- Display the head or regional office contact information; and
- Develop and implement a dust management plan (DMP), which may include measures to control other emissions, This DMP can be provided to Clare County Council for approval, if requested.

Site management:

- 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;
- Make the complaints log available to the Local Authority when asked and;
- 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 log book;

Prepare and maintaining the site:

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Fully enclose site or specific operations where there is a potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;

- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site, if they are being re-used on-site cover as described below; and
- Cover or fencing stockpiles to prevent wind whipping.

Operation vehicle/machinery and sustainable travel:

- Ensure all vehicles switch off engines when not in use – no idling vehicles;
- Avoid the use of diesel or petrol power generators and use mains electricity, battery powered equipment or other alternative with no emissions to air, where practicable;
- Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas;
- Produce a construction logistics plan to manage the sustainable delivery of goods and materials; and
- Implement a travel plan that supports and encourages sustainable travel.

Operations:

- Only use cuttings, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for the effective dust/ particulate matter suppression/ mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste management:

- No burning of waste materials.

Mitigation specific to dismantling:

- Ensure effective water suppression is used during dismantling operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems manually controlled can produce fine water droplets that effectively bring the dust particles to the ground; and
- Bag and remove any biological debris or damp down such material before dismantling.

7.7.1.3 Dust Control Measures to be Implemented at the Ash Storage Area

The site will continue to operate under an IE Licence, which sets limits on emissions to air, enforces monitoring and reporting requirements, set out environmental management measures and complaint management measures. All works need to be agreed in advance with the EPA. Works within the ASA must comply with the site's agreed Landfill Operational Plan and any decommissioning works must be in compliance with the site's Dust Management Plan.

The following dust control measures are set out in the Landfill Operational Plan[65] to limit the potential for adverse impacts from dust at the ASA and landfill. These dust control measures will continue to be applied during the operation of the proposed development.

[65] Landfill Operational Plan, Moneypoint Generating Station, April 2005.

- The material dispatched from the batching plant will be conditioned with water, leading to the material having the characteristics of lean mix concrete.
- Any conveyors used in material transport or placement will be contained.
- Material placed in the ASA will be immediately compacted which contributes to reduction of potential dust generation.
- Material placed, being placed or moved within the active landfill cell will receive additional wetting by water bowser where conditions may lead to fugitive dust emissions. If these means of dust control become inadequate due to extreme adverse weather conditions, material placement will stop until the weather conditions improve.
- On completion of each cell, the cell will be capped using ca.47.5% FGD by-product, ca.47.5% Ash and ca.5% cement mixture of minimum 0.6m thickness, and up to 1.6m with the proposed development, which in turn will be covered by a drainage layer, subsoil and topsoil layers. As was previously permitted, once complete the final profile will resemble a dome-like shape and will be finished with a layer of topsoil and seeded with meadow grass mix of native provenance. The capping and covering of each landfill cell on completion will minimise the potential for dust mobilisation from completed landfill areas.

In addition to the measures included in the Landfill Operation Plan, dust control measures presented in Section 7.7.1.3 with regards to 'site management' will be applied to any activities involving the removal of ash for sale or reuse in operational plant activities. All sales of ash involving exporting the material from the site will be undertaken using vehicles with covered loads to prevent escape of materials during transport.

The proposed development includes increased thickness of the stabilised FGD by-product capping layer which is expected to provide a more effective capping layer to each landfill cell further reducing the potential for dust emissions.

7.7.1.4 Operation – Existing Boilers and Auxiliary Boiler

For the operational scenarios associated with the proposed development no mitigation measures in addition to those already inherent to the design of the proposed development are required. It should be noted that the proposed development will be licensed by the EPA under the industrial emissions licensing process. The licence will state the limits for atmospheric emissions that the proposed development will be required to comply with.

7.7.2 Monitoring Measures

7.7.2.1 Coalyard and Ash Storage Area

The following dust monitoring measures are to be implemented during dismantling of the coalyard.

- Continue to undertake monitoring of dust deposition using mass deposition (Berghoff) gauges at the four existing monitoring sites surrounding the coal yard and ASA. The sampling interval, analytical technique and threshold should remain the same;
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority, if asked. This will include regular dust soiling checks of surfaces including cars and window sills within 100m of proposed development boundary to ensure dust control measures are effective;
- Carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the Local Authority when asked; and

- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

7.7.2.2 Operation – Existing Boilers and Auxiliary Boiler

Emissions from the existing boilers are currently monitored by a Continuous Emissions Monitoring System (CEMS). The CEMS would continue to operate with the proposed development and would be used to demonstrate compliance with the emission limits specified in the IE licence.

Emissions of NOx and CO[66] from the diesel auxiliary boiler would monitored on a periodic annual basis in accordance with the requirements contained within Annex III Part 1 of the MCPD.

7.8 Residual Impacts

There are no significant impacts predicted during the construction and operational phases for air quality with the successful incorporation of best practice mitigation and compliance with the industrial emissions licence.

[66] Monitoring is required for pollutants for which an emission limit value is laid down in the MCPD. Monitoring of CO is required for all plants regardless of technology or fuel.

8 Climate

8.1 Introduction

This chapter presents an assessment of the likely and significant climate impacts, caused by anthropogenic greenhouse gas (GHG) emissions resulting from the proposed development. The assessment is based on the development as described in Chapter 4 of this EIAR.

The assessment estimates the GHGs[67] associated with the proposed development arising from the operation of the proposed development and, where appropriate, considers mitigation measures to reduce potential effects. An assessment is made on the significance of the residual effects.

8.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the climate change impacts are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

8.2.1 Polices

8.2.1.1 International Climate Change Legislation and Policy

United Nations Framework Convention on Climate Change (UNFCCC)

Since 1992 Ireland has been a party to the UNFCCC[68], with consequent commitments of reducing GHG emissions and enhancing capacity to adapt to climate change. The Irish government reports its GHG emissions to the UNFCCC, including emission reduction strategies.

Paris Agreement 2016

Ireland is a signatory country of the 2016 Paris Agreement[69]. As part of this agreement, Ireland has adopted a nationally determined contribution (NDC) as presented by the EU on behalf of Member States in 2016. The NDC commits Parties to a 40% reduction in EU-wide emissions by 2030 compared to 1990.

[67] Greenhouse Gases (GHGs) refer to the seven gases covered by the Kyoto Protocol (which Ireland is a signatory of): carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3). These are measured in units of carbon dioxide equivalent (CO_2e) which expresses the impact of each gas in terms of the amount of CO_2 that would create the same impact. GHGs are commonly referred to as carbon.

[68] Gov.ie, EU and International Climate Action, 2021 [online] Available at: https://www.gov.ie/en/policy-information/428b3c-eu-and-international-climate-action/#:~:text=Ireland%20is%20a%20Party%20to%20the%20UNFCCC%2C%20reports%20directly%20to,(COP)%20through%20the%20EU [Accessed 11 September 2023]

[69] EPA, Paris Agreement, 2023 [online] Available at: https://www.epa.ie/environment-and-you/climate-change/what-is-europe-and-the-world-doing/paris-agreement/ [Accessed 12 September 2023].

EU Climate Legislation

The European Green Deal was established by the European Climate Law[70]**.** The Deal commits Europe to becoming the first climate-neutral continent (a net-zero balance of GHG emissions) by 2050. This Deal also includes a mid-term target of 55% GHG emissions reduction by 2030 against 1990 levels. This sets an ambitious EU 2030 target, through which systems for monitoring progress are created. The deal also aims to ensure that the transition to climate neutrality is irreversible.

As part of this legislation, the European Union's Emissions Trading Scheme (EU ETS)[71] was created. The ETS is a carbon market created to cost-effectively bring about reductions in GHG emissions in the following:

- CO_2 emissions from energy intensive industry, aviation, and electricity and heat generation;
- N_2O from the production of nitric, adipic and glyoxylic acids and glyoxal; and
- Perfluorocarbons (PFCs) from the production of aluminium.

The EU ETS is as a cap-and-trade system under which firms are allocated EU Allowances entitling holders to emit one tonne of CO_2e. These allowances can be traded between firms in the EU regulated carbon market.

The EU ETS has previously undergone three phases, with Phase 4 (2021-2030) reducing the overall number of EU Allowances annually by 2.2%. Moreover, the 2021 revision of the EU ETS in the 'Fit for 55' packages[72] increased the proposed European Commission emissions reduction target from 43% to 62% by 2030 compared with 2005 levels in the sectors covered by the EU ETS.

The 'Fit for 55' packages included the revision of existing laws as well as the release of five new proposals to ensure that EU legislation is in-line with the goal of reducing EU emissions by at least 55% by 2030 compared to 1990 levels. Additionally, in March 2023[73] the Council and the European Parliament reached a provisional political agreement on a revised directive to increase the proportion of energy from renewable sources from 32% to 40% by 2030.

8.2.1.2 Domestic Climate Change Policy and Legislation

Climate Action and Low-Carbon Development Act 2015 (Amended 2021)

The Act[74] was the first piece of legislation following the launch of the National Policy Position on Climate Action and Low Carbon Development (2014)[75]. It provided a direction to adopt and implement government plans to move to a low-carbon economy. The Act includes arrangements

[70] EC, European Climate Law, n.d. [online] Available at: https://climate.ec.europa.eu/eu-action/european-climate-law_en#:~:text=The%20European%20Climate%20Law%20sets%20a%20legally%20binding,of%20promoting%20fairness%20and%20solidarity%20among%20Member%20States. [Accessed 12 September 2023].

[71] EUR-Lex, Directive 2003/87/EC, 2023 [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003L0087 [Accessed 12 September 2023].

[72] EC, 'Fit for 55': Council adopts key pieces of legislation delivering on 2030 climate targets, 2023 [online] Available at: https://www.consilium.europa.eu/en/press/press-releases/2023/04/25/fit-for-55-_council-adopts-key-pieces-of-legislation-delivering-on-2030-climate-targets/ [Accessed 12 September 2023].

[73] EU, Council and Parliament reach provisional deal on renewable energy directive, 2023 [online] Available at: https://www.consilium.europa.eu/en/press/press-releases/2023/03/30/council-and-parliament-reach-provisional-deal-on-renewable-energy-directive/ [Accessed 12 September 2023].

[74] ISB, Climate Action and Low Carbon Development (Amendment) Act 2021, 2021 [online] Available at: https://www.irishstatutebook.ie/eli/2021/act/32/enacted/en/html [Accessed 12 September 2023].

[75] Gov.ie, National Policy Position on Climate Action and Low Carbon Development, 2021 [online] Available at: https://www.gov.ie/en/publication/6f393-national-climate-policy-position/ [Accessed 12 September 2023].

for achieving the transition to a low-carbon, climate-resilient and environmentally sustainable economy by 2050. The Act includes the following key elements:

- Integrates as a 'national climate objective', to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy;
- Mandated the creation of sector level adaptation plans;
- Determines that a National Long Term Action Strategy will be prepared every five years and shall specify projected reductions in GHG emissions, alongside an assessment of potential opportunities for achieving those reductions; and
- Introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and shall be updated every five years, being consistent with the carbon budget programme.

Climate Action Plan, 2024

The Climate Action Plan[76] is the third annual update of Ireland's Climate Action Plan 2019, builds upon Climate Action Plan 2023 by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings. This plan highlights Ireland's commitment to achieving a 51% reduction in GHG emissions between 2021 and 2030, and to achieve net-zero emissions no later than 2050. These legally binding objectives are set out in the Climate Action and Low Carbon Development (Amendment) Act 2021[77].

The Climate Action Plan notes the requirement of transformational policies, measures and actions, and societal change to increase the deployment of renewable energy generation, to strengthen the electricity grid, and meet the demand and flexibility needs required for the challenges of:

- *"Increasing renewable generation to supply 80% of demand by 2030 through the accelerated expansion of onshore wind and solar energy generation, developing offshore renewable generation, and delivering additional grid infrastructure."*
- *"Transforming the flexibility of the electricity system by improving system services and increasing storage capacity."*

To reach 2030 targets, the Climate Action Plan aims to phase out the use of coal and peat in electricity generation. The Plan notes that the Zero Emission Vehicles Ireland (ZEVI) initiative launched in July 2022 has been established with supporting consumers, the public sector and businesses to continue to make the switch to zero emission vehicles. The Plan also encourages greater usage of lower carbon cement and concrete in construction. This supports mitigation measures in the construction and operation of the proposed development.

National Energy and Climate Plan 2021-2030

Ireland is committed to achieving a 7% annual average reduction in GHG emissions between 2021 and 2030. This plan is in line with the EU effort-sharing approach[78] and includes policies and measures currently being developed to achieve the 7% reduction trajectory. These measures comprise the establishment of carbon budgets, a strengthened Climate Change

[76] Gov.ie, Climate Action Plan 2024, 2024 [online] Available at: https://www.gov.ie/en/publication/79659-climate-action-plan-2024/ [Accessed February 2024].

[77] ISB, Climate Action and Low Carbon Development (Amendment) Act 2021, 2021 [online] Available at: https://www.irishstatutebook.ie/eli/2021/act/32/enacted/en/html [Accessed 12 September 2023].

[78] Gov.ie, Ireland's National Energy and Climate Plan 2021-2030, 2021 [online] Available at: https://www.gov.ie/en/publication/0015c-irelands-national-energy-climate-plan-2021-2030/ [Accessed 12 September 2023].

Advisory Council (CCAC) and greater accountability to the Parliament, managed through new governance arrangements. The key objectives most relevant to the energy sector are:

- Achieve a 34% share of renewable energy in energy consumption by 2030. Increase electricity generated from renewable sources to 70%;
- Contribute towards the EU wide target of achieving at least 32.5% improvement in energy efficiency by 2030;
- Maintaining the security of Ireland's energy system in the most cost-effective manner; and
- Develop further interconnection to facilitate Ireland's 2030 target of 70% renewable electricity.

National Development Plan 2021-2030

The National Development Plan - Chapter 3 (Climate Action and the Environment)[79] comprises measures to tackle climate change, including mitigation and adaptation, alongside a transition to a circular economy. The Plan aims to enable change to reduce the GHG emissions in Ireland, including energy efficiency and low-carbon electricity.

The Plan contains several Sectoral Strategies including energy. This Sectoral Strategy states that "public capital investment choices over the next 10 years must not only contribute to the objective of a 51% reduction in GHG emissions by 2030, but also lays a path to achieve the national climate objective of net-zero GHG emissions by 2050". Decarbonising energy is noted as a priority, with the objective of transitioning to "net-zero carbon, reliable, secure, flexible and resource-efficient energy services at the least cost for society" before 2050.

The Programme for Government – Our Shared Future

The Programme for Government – Our Shared Future[80] sets out the Government's ambition for the future, including the response to climate change. Energy is set out as having a "central role" in growing a sustainable economy, with a focus on "safe, secure and clean energy" to decarbonise the energy sector by phasing-out the use of fossil fuels. The document sets out actions to achieve 70% renewable electricity by 2030 and commits to developing new standards to reduce emissions from F-gases.

Climate Change Adaptation Strategy 2019-2024 and Draft Climate Action Plan 2024 - 2029

Clare County Council developed a Climate Change Adaptation strategy[81], which has an approach of targeting energy efficiency opportunities and increasing the renewable energy share of energy consumption. The Draft Climate Action Plan 2024 – 2029 has been published[82], and includes commitments to reducing the Council's own GHG emissions impacts, as well as actions to enable increased uptake in GHG reduction measures in the County. This includes supporting development of renewable energy infrastructure.

The county is promoting measures to reduce GHG emissions, such as encouraging proposals for renewable energy developments and ancillary facilities to: meet national, regional and

[79] Gov.ie, National Development Plan 2021-2030, 2021 [online] Available at: https://www.gov.ie/en/publication/774e2-national-development-plan-2021-2030/ [Accessed 12 September 2023].

[80] Gov.ie, Programme for Government: Our Shared Future, 2021 [online] Available at: https://www.gov.ie/en/publication/7e05d-programme-for-government-our-shared-future/ [Accessed 12 September 2023].

[81] Clare County Council, Climate Change adaptation Strategy 2019-2024 [online] Available at: https://www.clarecoco.ie/services/environment/publications/clare-climate-change-adaptation-strategy-2019-2024-33843.pdf [Accessed 12 September 2023].

[82] Clare County Council, Draft Climate Action Plan 2024-2029 [online] Available at: https://yoursay.clarecoco.ie/climate-action-plan [Accessed 21 December 2023]

county renewable energy targets; facilitate a reduction in CO_2 emissions; promote a low carbon economy through planning policy and land use.

8.2.2 Guidelines

This GHG assessment follows the considerations set out by the EIA Guidance on 'Assessing GHG Emissions and Evaluating their Significance of the Institute of Environmental Management and Assessment' (IEMA) published in 2022[83] (referred to hereafter as the IEMA Guidance). This guidance includes the requirements for GHG emissions assessment, mitigation and reporting in statutory and non-statutory Environmental Impact Assessment.

8.3 Methodology

8.3.1 Approach to Data Collection

The following information and data sources (Table 8.1: Data Sources used to inform the climate chapter of this EIAR) have been considered during the production of this EIAR.

Table 8.1: Data Sources used to inform the climate chapter of this EIAR

Data source	Date	Data contents
ESB, "2021 Moneypoint Emissions FINAL Spreadsheet 20220207" document	05/09/2023	Moneypoint annual CO_2e emissions in 2021.
ESB, "FINAL 2022 Moneypoint Emissions Spreadsheet" document	05/09/2023	Moneypoint annual CO_2e emissions in 2022.
Ireland's National Inventory Report 2023[84]	06/09/2023	National and sectorial GHG emissions by 2021.
Environmental Protection Agency[85]	06/09/2023	Energy sector CO_2e emissions and projections
ESB Resource and Waste Inventory	14/12/2023	Dimensions and material quantities for construction.
UK Government GHG Conversion Factors for Company Reporting[86]	14/12/2023	Emission factor for GHG reporting.
Mott MacDonald, Moata Carbon Portal[87]	14/12/2023	Emission factors for excavation.

8.3.2 Approach to Impact Assessment

According to the EU Guidance on the preparation of the Environmental Impact Assessment Report[88] (Directive 2011/92/EU as amended by 2014/52/EU), the environmental impact assessment shall identify, describe, and assess significant effects of a project; for climate change mitigation, the impact assessed is the nature and magnitude of GHG emissions.

[83] IEMA, Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2022 [online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions [Accessed 12 September 2023].

[84] Ireland 2023 National Inventory Report, 2023 [online] Available at: https://unfccc.int/documents/627850 [Accessed 6 September 2023].

[85] Environmental Protection Agency, 2023 [online] Available at: https://www.iea.org/reports/co2-emissions-in-2022 [Accessed 6 September 2023].

[86] UK Government GHG Conversion Factors for Company Reporting, 2023 [online] Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 [Accessed 14 December 2023].

[87] The Moata Carbon Portal is Mott MacDonald's in-house carbon assessment tool. It is an infrastructure carbon calculator with PAS 2080 certification.

[88] EUR-Lex, Directive 2011/92/EU, 2014 [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011L0092 [Accessed 12 September 2023].

GHG emissions are calculated based on the rate of an activity (e.g., quantity, mass and type) multiplied by an emission factor of a recognised source:

$$\text{Emissions } (tCO_2e) = \text{rate of activity (unit)} \times \text{emission factor } (tCO_2e \text{ /unit})$$

The approach taken in this assessment aligns with the IEMA Guidance.

8.3.3 Study Area

The study area for GHG assessment is based on activities, rather than a physical boundary. The proposed development includes continued generation and associated change of fuel type used (ie from coal to HFO) of Moneypoint Generating Station. This will consist of the transition and conversion of the existing coal-fired power station's primary fuel to Heavy Fuel Oil (HFO), considering limited run hours from late 2024 to late 2029 (when the station will cease generation).

This GHG emissions assessment considers only operational emissions from using HFO as primary fuel, as these will be the most significant source of impact over the lifetime of the proposed development. The majority of the existing infrastructure at Moneypoint Generating Station can be utilised, and the necessary electricity transmission infrastructure is already in place, this reduces potential environmental impacts during construction by avoidance.

The scope and methodology of the assessment are summarised in Table 8.2.

Table 8.2: Summary of methodology for carbon assessment

Project lifecycle stage	Methodology	Scope assessed
Construction: Products and materials	Emissions quantified based on volumes provided by the technical MM experts, including excavated, exported, reused and imported materials, in the construction phase. Distances for materials transport to work site data were referenced from the RICS professional standard "Whole life carbon assessment for the built environment".	Included: Key construction materials are included for the HFO bund walls, floor and foundations, the auxiliary boiler, and ancillary structures. Also included is an estimation of transporting materials to site, and of emissions associated with the excavation works.
Construction: Transport to works site		
Construction: Plant emissions		
Operation	Emissions estimated based on projected fuel use of the proposed development (in line with Chapter 4). Baseline emissions based on existing data gathered for 2021 and 2022 (provided by Moneypoint).	Included: Operation is included into this assessment considering the use of HFO as the most significant activity.
Decommissioning	n/a	Excluded: Overall impact of decommissioning is likely to be similar to that at construction. It is unlikely to be significant in comparison to operational emissions. Based on industry experience, as site-specific data not available at the time of assessment.

8.3.4 Limitations of this EIAR

The baseline was developed using the scenario of business as usual (BaU), by referencing the carbon emissions estimated in 2021 and 2022 by Moneypoint Generating Station. The estimation of GHG emissions uses an average of the 2021 and 2022 data as a baseline.

The operational calculations were undertaken assuming an extended running of 3,000 hours per unit per year as indicated in Chapter 4, as well as a planned usage at full load of 216 tonnes of HFO per hour. The carbon intensity of HFO is assumed to be the same as HFO used on site at the existing Moneypoint Generating Station over the last number of years.

The impact of construction is assumed to be insignificant in comparison to operational emissions based on industry experience, it has not been estimated due to data uncertainty at this design stage.

8.4 Receiving Environment

It is noted that unlike some other impacts, the nature of GHG emissions means that the ultimate receptor is the global climate system. Climate change resulting from anthropogenic GHG emissions will lead to social, environmental and economic impacts felt globally, regardless of where the GHGs are emitted. Therefore, emissions of an individual project are not easily linked to a specific receptor.

The relevant baseline for the GHG assessment is the operation of the current Moneypoint Generating Station. The baseline is taken as the average across the last two operating years (2021 and 2022) is calculated as 2,940 $ktCO_2e$. Emissions are set out below by fuel type in Table 8.3.

Table 8.3: Baseline Emissions Data

	2021 GHG emissions (k tonnes) *	2022 GHG emissions (k tonnes) *	Baseline: Average GHG emissions (k tonnes) *
Coal	2,618	2,196	2,407
HFO	603	449	526
Gas oil	4	3	3,240
Temp Boiler Gas Oil	0	0.1	0,1
Urea	3	3	3
Sodium Polyacrylate	0.5	0.3	0.3
Total	**3,229**	**2,652**	**2,940**

* Emissions may not sum due to rounding

Based on the 2022 numbers, the emissions associated with Moneypoint Generating Station are approximately 5% of total Irish emissions, or 31% of the power generation sector in Ireland in 2022 (the most recent year reported at time of writing), see Table 8.4.

Table 8.4: Comparison to EPA Reported Emissions

	2022 GHG emissions	Baseline emissions	Baseline as a %
Country emissions total ($MtCO_2e$)	60.76	2.94	5
Energy sector emissions (Public electricity and heat production) ($ktCO_2e$)	9612	2941	31

Source: Percentages calculated. Irish emissions data from the EPA 2023 GHG emissions reporting: Environmental Protection Agency (EPA) [89]

For further comparison, the emissions from the existing Moneypoint Generating Station are calculated as approximately 324 gCO_2e /kWh, compared to a national average of 331 gCO_2/kWh in 2022[90].

[89] Environmental Protection Agency (EPA), Greenhouse gas emissions, 2023 [online] Available at: https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/energy-/ [Accessed 13 September 2023].

[90] EPA, Energy, 2023 [online] Available at: 2023-EPA-Provisional-GHG-Report_Final_v3.pdf [Accessed 12 September 2023].

8.5 Likely Significant Impacts

8.5.1 Do Nothing

If the proposed conversion to HFO as the primary fuel and two new HFO tanks does not proceed, it is possible that extended power outages could occur in the absence of sufficient generators or fuel to cover the winter peaks in the period 2024 to 2029. To maintain security of supply it will be necessary to continue the operation of Moneypoint fuelled by coal (see Chapter 3 for details).

Given the uncertainty of fuel type and firing hours for the 'do nothing' scenario, it is not possible to calculate emissions. Should coal be the primary fuel, or a mixture of coal and HFO, with operating hours similar to the proposed development, then emissions would be larger than the proposed development; should only HFO be used, then emissions would be similar to the proposed development.

Section 8.5.3 presents a comparison of do nothing scenario with the proposed development.

8.5.2 Construction Phase

Emissions arise during construction from the use of materials (GHGs are emitted during manufacture, transportation and processing of raw materials), transporting materials to site, construction plant fuel use and disposal of waste.

The partial dismantling and removal of coal handling plant, as described in Section 4.2.7, is screened out for this assessment as the scale of impacts will be significantly lower than proposed construction works as recycling and reusing of materials will be implemented, and hardstanding will be reused for the proposed renewable energy development.

A quantification has been made based on quantities of resources needed for construction of HFO bund walls, floor and foundations, auxiliary boiler, and ancillary structures, as well as expected excavations. This totals approximately 12 $ktCO_2e$ during construction. The emissions estimation uses proposed quantities of raw materials required and applies industry standard emissions factors from UK Government GHG Conversion Factors for Company Reporting (2023)[91] and ICE Database V3 (2019)[92]. It is noted that for concrete, the proposed development has set a specification to use cement replacers to reduce the embedded emissions in manufacturing the concrete (35% ash as cement replacer).

This is a high-level estimation, and additional emissions would arise from use of fuel and energy in construction activities, use of any construction accommodation or site offices, water consumed during construction and workers transport to and from site. Resulting emissions are a negative effect, estimated at approximately 1% of annual operating emissions and therefore regarded as not significantly changing the result of the impact assessment[93].

The breakdown of construction emissions is shown by structure type in Figure 8.1. The HFO bund walls, floor and foundations are the most impactful structures (87% of total materials footprint). The majority of emissions in the HFO bund walls, floor and foundations are in the

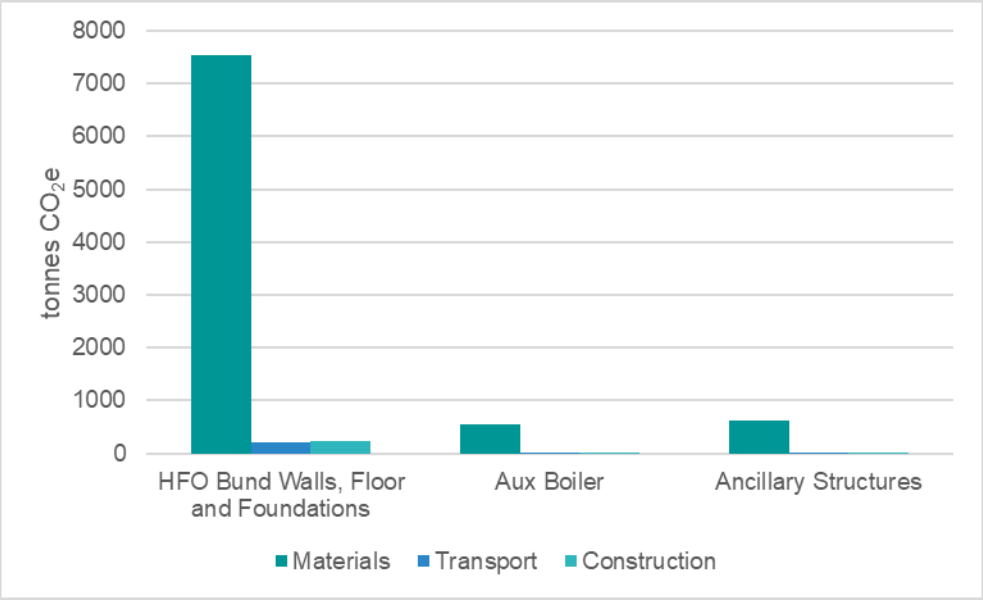
[91] DESNZ, Greenhouse gas reporting: conversion factors 2023 (2023) [online] Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 [Accessed 13 September 2023]

[92] Circular Ecology, Embodied Carbon – the ICE database (2019 [online] Available at: https://circularecology.com/embodied-carbon-footprint-database.html [Accessed 13 September 2023]

[93] Following the IEMA guidance on assessing GHG emissions, "activities that do not significantly change the result of the assessment can be excluded where […] all such exclusions total a maximum of 5% of total emissions". IEMA, Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2022 [online] Available at: https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions [Accessed 12 September 2023].

main from steel cladding (43% of total materials footprint), followed by concrete (24% of total materials footprint).

Figure 8.1: Construction emissions by structure



Emissions have been split by lifecycle stage for construction where we have estimated emissions associated with: production of materials; transport of those materials to works site; and construction plant emissions. The breakdown by lifecycle stage is shown in Figure 8.2 and Table 8.5 below.

Figure 8.2: Construction emissions by lifecycle stage

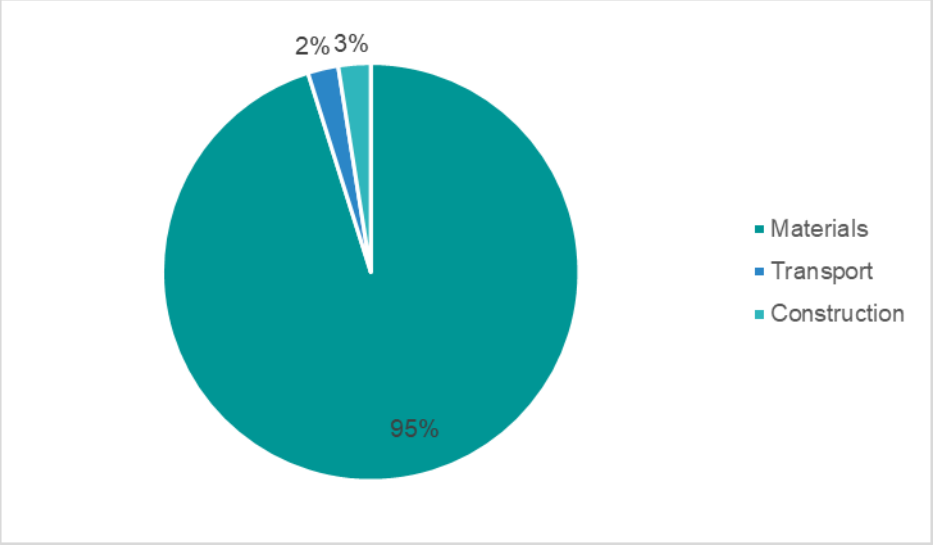


Table 8.5: Estimated Emissions for Construction Phase

Whole life carbon modules	Emissions (tCO_2e)*
Materials	8,700
Transport	220

Whole life carbon modules	Emissions (tCO_2e)*
Construction activities: excavation	30
Construction activities: waste and waste management	200
Total	9,150

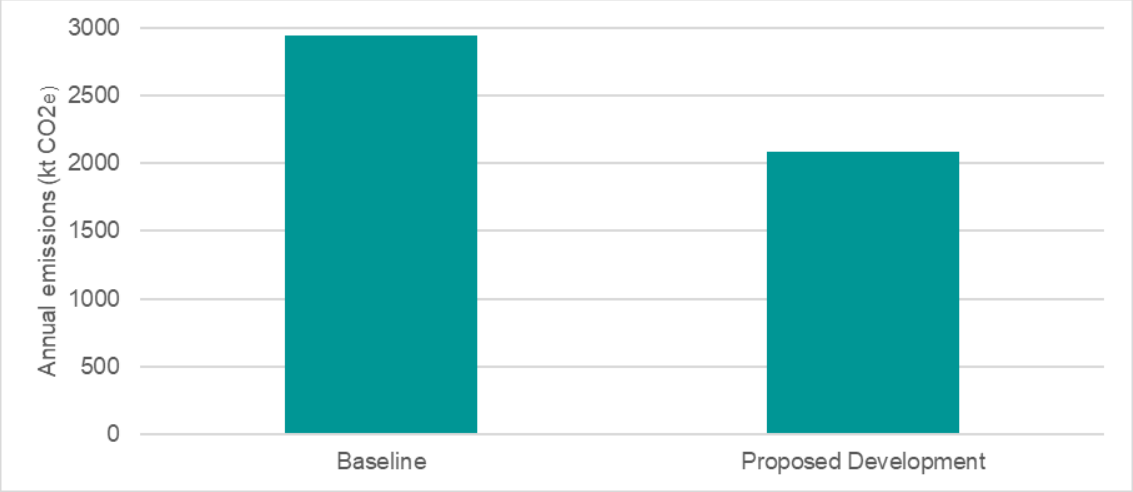
* Emissions rounded to nearest 10 tonnes, totals may not sum due to rounding.

8.5.3 Operation and Maintenance Phase

Emissions have been estimated for HFO combustion, based on consumption of 216 tonnes of HFO/hour over 3,000 hours of annual operation. Assuming the same emissions intensity for HFO combustion as reported in the baseline data, operational GHG emissions are 2,081 $ktCO_2e$/year and 10,406 $ktCO_2e$ over the five-year operation phase 2024-2029.

The proposed development is expected to have a lower footprint by approximately 859 $ktCO_2e$/year, which is equivalent to 29% lower GHG emissions. This is presented in Figure 8.3.

Figure 8.3: Operational Emissions Baseline vs Proposed Development



The calculated GHG intensity (emissions per kWh energy generated) of the proposed development is also lower than the baseline, as HFO is a less carbon-intensive fuel than coal. The proposed development emissions intensity is estimated at 286 gCO_2e/kWh, a 12% reduction on the baseline.

The EPA report annually on GHG emissions for Ireland, including sector breakdowns and emissions projections. Projections are produced for two scenarios: With Existing Measures (WEM), and With Additional Measures (WAM). The WEM projections note an assumption that the coal fired Moneypoint Generating Station ceases to operate by the end of 2025. It is unclear from the report whether any continued use of alternative fossil fuels at the Moneypoint site has been accounted for beyond 2025.

Table 8.6 presents baseline emissions against the 2022 emissions for Ireland, next to the estimated emissions for the proposed development against the 2030 projections for Ireland.

Table 8.6: Estimated Emissions Compared to National Inventory Emissions

	Emissions ($ktCO_2e$/year)	Power station as % of sector or national emissions
Baseline		
Baseline emissions	2,941	

	Emissions ($ktCO_2e$/year)	Power station as % of sector or national emissions
National emissions 2022	60,760	5%
Energy sector emissions 2022	9,612	31%
Proposed Development		
Proposed development emissions (operation)	2,081	
Proposed development emissions (construction)	9	
Projected national emissions 2030 WEM scenario	52,552	4%
Projected national emissions 2030 WAM scenario	42,267	5%
Projected sector emissions 2030 WEM scenario	5,400	39%
Projected sector emissions 2030 WAM scenario	4,500	46%

The baseline is estimated at 5% of national emissions, or 31% of the energy sector in 2022.

The proposed development is estimated at 4-5% of projected national emissions in 2030 (2030 is the closest projection available[94], the actual end date of the proposed development will be 2029. A range is provided for different scenarios). Future projections model a significant decrease in energy sector emissions, and therefore the impact of the proposed development on total sector emissions increases over time. The proposed development annual emissions would be approximately 39-46% of total projected Irish energy sector annual emissions if operating in 2030.

The proposed development will continue the use of fossil fuels in energy production and does not directly support the national targets of reducing GHG emissions by 51% (against 2021 emissions) by 2030. However, the proposed development is temporary in nature and does partially support the National Energy and Climate Plan 2021-2030 because it provides a lower carbon alternative to coal generation. The proposed development is not expected to be operating in 2030, which is the year by which national targets have committed to making significant reductions in GHG emissions.

Based on the IEMA Guidance, the overall significance of a project is related to its contribution to national or sectoral pathways towards net zero. The IEMA Guidance states that a project would result in a significant adverse effect if it "follows a 'business-as-usual' or 'do minimum' approach and is not compatible with […] net zero trajectory, or accepted aligned practice, or area-based transition targets". Therefore, emissions from the operation of the proposed development are expected to be **major adverse and significant**. The proposed development has a 12% lower emissions intensity than the existing coal-fired plant and presents lower emissions through transition to HFO than a 'do nothing' scenario with continued use of coal.

8.5.4 Decommissioning Phase

On cessation of activities the plant will be decommissioned, applying mitigation measures to ensure the proposed development is decommissioned in a low-impact way. As mentioned in Chapter 4, recycling and reusing of materials will be implemented, and hardstanding will be reused for the proposed renewable energy development. The GHG emissions generated in the decommissioning phase are not quantified at present, but activities will result in emissions likely to be similar in scale to construction emissions. This is a negative effect but is unlikely to be significant when compared with the operating emissions.

[94] Environmental Protection Agency (EPA), 2022, Ireland's Greenhouse Gas Emissions Projections 2021-2040 [online] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Ireland's-GHG-Projections-Report-2021-2040v4.pdf [accessed 13th September 2023]

A Decommissioning Management Plan (DMP) for the proposed development will be prepared in accordance with the IE licence application. This will include details of decommissioning of all plant and equipment ensuring that there will be no environmental pollution and minimising GHG emissions. Consideration will also be given to reuse or repurposing of the bund, HFO tanks and boiler house as part of future site developments.

8.6 Cumulative Effects

The nature of GHG emissions means that the ultimate receptor is the global climate system. This GHG assessment does not consider cumulative effects, as GHG emissions do not result in a regional or local effects on climate and, therefore, the effects of the project's emissions on climate will not differ when combined with other developments. This approach is in accordance with the IEMA Guidance, which states: "*effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other*".

It is noted that Irish policy looks to reduce emissions from the power sector significantly by 2030, and that the proposed development will contribute to the national inventory. Other applications for new fossil fuel power plants will also contribute to national emissions and make it harder to meet national GHG reduction commitments.

8.7 Mitigation and Monitoring Measures

8.7.1 Mitigation Measures

The following mitigation measures apply in relation to construction impacts on climate change, and will be considered in the construction of the proposed development:

- Integrate GHG emissions reduction from the early design stage, promoting GHG saving opportunities when determining the definitive specifications of products, materials, and layouts, and explore alternatives to achieve the desired development.
  - For example, the proposed development has set a specification to use cement replacers to reduce the embedded emissions in manufacturing the concrete (35% ash as cement replacer), where technically practicable.
- Take a planned approach focused on GHG emissions reduction, using good construction practices and energy efficient processes and technologies, including the re-use or refurbishing of existing assets.
- Promote fuel switching or substitution in transport of materials to site, as well as efficient route scheduling with suppliers.
- Design for decommissioning to reduce wastage of materials and enable reuse of components where appropriate.

Several of these mitigation measures are in line with Ireland's Climate Action Plan under the public sector mandates to procure only zero emissions vehicles from the end of 2022, and for public bodies to specify usage of lower carbon cement and concrete (where practicable) from 2023.

During operation, when emissions are anticipated to be greatest, the following mitigation measures are recommended:

- Regular maintenance checks to ensure that the station and other equipment are operating according to calculated efficiency rates and that best practice control measures will be implemented to mitigate against GHG emissions.

- Application of the circular economy hierarchy, reduce, re-use, repair and recover when maintenance is undertaken, as well as use of good practices by value-chain members.
- Promote fuel switching or substitution in transport of fuel and other consumables to site, as well as efficient route scheduling with suppliers.

8.7.2 Monitoring Measures

- Monitoring is recommended to keep track of emissions:
- Continue with monitoring and reporting fuel shipment data and bimonthly sample data for HFO, including the calculation of GHG emissions, as per GHG permit.
- The annual GHG emissions will be driven by the operating profile of the proposed development. The total GHG emissions will therefore be minimised by increasing efficiency and by using the breakout clauses in 2027 and 2028 if sufficient new generation has entered the market.

8.8 Residual Impacts

Mitigation measures are not quantified at this stage of assessment and therefore residual impacts are the same as reported under likely significant impacts.

The IEMA Guidance recommends contextualisation of a project's GHG emissions to determine alignment with a trajectory towards net zero. The starting point for contextualising emissions is to consider the consider the percentage contribution to national or sector carbon budgets. As stated in Section 8.5.3 the proposed development is estimated at 4-5% of projected sector emissions in 2030 (the closest projection year available to project closure in 2029). This is a considerable impact for one project towards the annual national carbon budget. There are other new fossil fuel developments proposed in Ireland at present[95], as with the proposed development these are intended to displace more carbon-intensive generation. The proposed development will have lower emissions than the existing Moneypoint Generating Station by approximately 29%. However, it will continue the use of fossil fuels in energy production and does not fully support the national targets of reducing GHG emissions by 51% (against 2021 emissions) by 2030.

The sector projections (EPA, 2022) to meet carbon reduction targets show a decrease in GHG emissions with annual carbon budgets, to meet the 2030 target. In 2030 the projection is for 70% renewable energy generation, with the remainder met by a mix of natural gas, coal, and peat. As the proposed development replaces existing coal-fired generation capability, it does align with an objective of the Climate Action Plan 2024, which states to phase out and end the use of coal and peat in electricity generation. The proposed development is planned to finish operation in 2029 and therefore will not contribute to emissions in 2030, the year of the 51% emissions reduction target.

[95] For example, the Shannon LNG plant, which received a recommendation to grant the permission for the power generation plant and refuse it for the proposed LNG import terminal on the basis of no-compliance with the Policy Statement on the Importation of Fracked Gas (An Bord Pleanala (2023) Inspector's Report ABP-311233-21). The inspector considered that the cause of the refusal was not to be based on a fossil fuel as primary fuel source, as this was found to be 'adequately mitigated' including having a role in displacing older more carbon-intensive generation (Moneypoint coal-fired power station is specifically named as being displaced).

9 Noise and Vibration

9.1 Introduction

This chapter presents an assessment of the likely and significant effects arising due to noise and vibration from the proposed development at Moneypoint Generating Station. The assessment is based on the development as described in Chapter 4 of this EIAR.

9.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the noise and vibration impact assessment are set out in this section.

9.2.1 Polices

The Environmental Noise Regulations (ENR)[96] transpose the EU Directive 2002/49/EC[97] (commonly referred to as the Environmental Noise Directive (END)) for the strategic control of environmental noise within the Republic of Ireland. The ENR was revised and revoked by the European Communities (Environmental Noise) Regulations 2018[98].

Nuisance due to noise is dealt with by the Environmental Protection Agency Act S.I. No. 7/1992 (as amended)[99], and the Protection of the Environment Act 2003 S.I. No.27/2003 (as amended)[100] require Best Available Techniques in controlling noise as a result of human activity *"which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment"*. Both acts clarify that 'noise' includes vibration.

9.2.2 Guidelines

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. In addition to specific noise and vibration guidance documents, the following guidelines were considered and consulted in the preparation of this chapter:

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022).
- Draft EPA Advice Notes for Preparing Environmental Impact Statements (hereafter referred to as the Draft EPA Advice 2015) (EPA, 2015).

There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines

[96] Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006).

[97] The European Parliament and the Council of the European Union, 2002. Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise.

[98] The European Communities (Environmental Noise) Regulations 2018 (Statutory Instrument No. 549/2018).

[99] Government of Ireland. Environmental Protection Agency Act, 1992.

[100] Government of Ireland. Protection of the Environment Act, 2003.

relating to noise and / or vibration impact for environmental sources. These are summarised below:

- British Standard Institution (BSI) British Standard (BS) 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 1: Noise
- BS 5228 (2009 +A1 2014) Code of practice for noise and vibration control of construction and open sites - Part 2: Vibration
- BS 7385 (1993) Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration
- BS 6472 (2008) Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting
- European Communities (EC) (Environmental Noise) Regulations 2018 (S.I. No. 549 / 2018)
- EC (Environmental Noise) Regulations 2006 (S.I. No. 140/2006)
- EC Noise Emission by Equipment for Use Outdoors (Amendment) Regulations (S.I. No. 241 / 2006)
- International Organization for Standardization (ISO) 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation
- ISO 1996-1 (2016) Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures
- ISO 1996-2 (2017) Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels
- National Roads Authority (2004) Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1
- National Roads Authority (2014) Good Practice Guide for the Treatment of Noise during the Planning of National Road Schemes Noise Guidelines
- UK Department of Transport and Welsh Office (1988) Calculation of Road Traffic Noise (CRTN)
- World Health Organization (WHO) (2018) Environmental Noise Guidelines for the European Region
- Institute of Environmental Management and Assessment (IEMA) (2014) Guidelines for Environmental Noise Assessment

9.3 Methodology

The proposed development is expected to give rise to both temporary (construction) and permanent (operational) noise and vibration impacts. The potential for these to result in significant adverse effects has been considered within separate construction and operational assessments. This section describes the approach to the assessment based on the various relevant requirements and criteria. Cumulative impacts due to the contributions of noise from other nearby licenced sites are also assessed.

9.3.1 Approach to Data Collection

The following information and data sources (Table 9.1) have been considered during the production of this EIAR.

Table 9.1 Data sources used to inform the noise and vibration chapter of this EIAR

Data source	Date	Data contents
Moneypoint Generating Station, Environmental noise monitoring, Allegro acoustics, DC2229-01	June 2022	Baseline noise data
Moneypoint Generating Station, Environmental noise monitoring, Allegro acoustics, DC2287-01	January 2023	Baseline noise data
Moneypoint Wind Farm compliance noise monitoring, AWN Consulting, DK/17/9575NR02a	October 2017	Baseline noise data
Transport Infrastructure Ireland (TII) (https://www.tii.ie/)	Various	Traffic data

Source: Mott MacDonald

9.3.2 Approach to Impact Assessment

9.3.2.1 Construction Noise

BS 5228 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise (2009+A1:2014)[101] has been adopted for the assessment of temporary noise impacts due to dismantling and construction. This standard provides comprehensive guidance including details of typical noise levels associated with items of plant and activities, prediction methods, and options for mitigation measures, and therefore has been considered appropriate for use in this assessment.

9.3.2.2 Construction Vibration

BS 5228 Part 2: Vibration[102] provides guidance on the assessment of vibration due to construction activity. The Standard considers levels of vibration from construction in terms of peak particle velocity (ppv) defined as the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position and is expressed in millimetres per second (mm/s). Indicative levels of vibration at due typical construction activities are described, along with case history data of vibration for various types of activity. BS 5228 Part 2 includes guidance on the levels of vibration that correspond with reported disturbance of occupants of residential buildings and with cosmetic or structural damage to different types of buildings.

9.3.2.3 Construction Traffic

Changes in noise from road traffic on public roads can arise due to diversion routes (not required for the proposed development) or due to additional traffic for the transfer of materials and equipment and the attendance of site personnel. The National Roads Authority Guidelines[103] and Guidance[104] do not provide a method for the assessment of temporary changes in road traffic noise associated with construction, specifically. However, the 2014 Guidance describes requirements for noise monitoring in Section 3.13. This states:

"*The baseline noise level should be established for every noise-sensitive building or group of buildings where traffic noise levels are likely to change significantly as a result of the scheme. This includes areas where traffic flows are reduced by 20% or more, and where existing flows are increased by 25% or more. Traffic noise will also change where traffic parameters other*

[101] British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'.

[102] British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'.

[103] National Roads Authority (2004) Guidelines for the treatment of noise and vibration in national road schemes, Revision 1

[104] National Roads Authority (2014) Good practice guide for the treatment of noise during the planning of national road schemes noise guidelines

than total flow volumes are changed. An increase in the percentage of heavy vehicles, or in traffic speed, will also lead to increases in traffic noise. It is sufficient to calculate the Basic Noise Level with and without the scheme to determine whether there would be a difference of 1dB or more."

This is mainly concerned with permanent changes in road traffic noise but indicates that a change of 1 dB is considered to be significant. Although the proposed development is not a road scheme, this is adopted for the assessment of temporary changes in road traffic noise as a result of the proposed development on a precautionary basis.

9.3.2.4 Operational Noise

The EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016)[105] describes a methodology to assess and control the predicted and measured noise impacts associated with licenced sites. It specifically considers operational noise impacts only. For construction-related noise, the Guidance states this is not a licensable aspect of site noise and is generally covered by conditions attached to a planning permission. BS 5228 Part 1[101] and Part 2[102] are referenced as relevant guidance.

The NG4 Guidance sets out a methodology for setting appropriate noise criteria on operational noise emissions with the potential to affect Noise Sensitive Locations (NSLs). NSLs are defined as "*Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*."

Firstly, sites are screened to determine whether they are Quiet Areas based on the proximity of the proposed development to urban areas and other major sources of environmental noise. The Quiet Area Noise Criteria for applicable sites is a limit defined as 10 dB below the average background noise level for the day (07:00 to 19:00), evening (19:00 to 23:00) and night-time (23:00 to 07:00) periods obtained by long-term noise monitoring.

For NSLs that are not identified as being within Quiet Areas, the NSLs are first screened for low background noise defined as those where the average background noise levels (L_{AF90}) are less than or equal to:

- Daytime: 40 dB L_{AF90}
- Evening: 35 dB L_{AF90}
- Night-time: 30 dB L_{AF90}

The noise criteria for NSLs with low background noise are:

- Daytime (07:00 to 19:00) 45 dB $L_{Ar,T}$
- Evening (19:00 to 23:00) 40 dB $L_{Ar,T}$
- Night-time (23:00 to 07:00) 35 dB $L_{Aeq,T}$

where $L_{Ar,T}$ is the rated noise level, which is equal to the L_{Aeq} plus any correction for tonal or impulsive acoustic features.

Where low background noise criteria are not met, then the general criteria apply as follows:

- Daytime: (07:00 to 19:00) 55 dB $L_{Ar,T}$
- Evening: (19:00 to 23:00) 50 dB $L_{Ar,T}$
- Night-time: (23:00 to 07:00) 45 dB $L_{Aeq,T}$

[105] Environmental Protection Agency Office of Environmental Enforcement Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). January 2016.

The EPA NG4 Guidance states that the limit values for noise from licensed sites apply to "*noise attributable solely to on-site activities, expressed as a free field value at any NSL*".

The existing Moneypoint Generating Station holds an Industrial Emission Licence (P0605-04)[106]. Section B.4 of this licence includes limits on noise emissions as follows:

- Daytime: 55 dB L_{Aeq} (30 minutes)
- Evening: 50 dB L_{Aeq} (30 minutes)
- Night-time: 45 dB L_{Aeq} (30 minutes)
- There will be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive receptor during night-time period
- Wind turbine noise shall not exceed 45 dB L_{Aeq} at any time or contain any significant tonal components

The above limits apply to operational noise.

With regards to monitoring to assess compliance with the requirements of the Licence, Condition 4 clause 4.5 states: "*Noise from the installation shall not give rise to sound pressure levels measured at NSLs which exceed the limit value(s)*."

The operational noise levels will be predicted by using 3-dimensional computer modelling software that based on the methodology provided in ISO 9613-2 (1996)[107] at all of the considered NSLs which are mostly likely to be affected by operational noise.

9.3.2.5 Operational Vibration

Operational vibration due to the proposed development is considered to be negligible (as has been the case for the existing power station). No significant effects are likely in particular given the separation distance to the nearest NSLs. Operational vibration is not considered further.

9.3.2.6 Receptor Sensitivity

The effects of environmental noise take various forms including but not limited to annoyance, sleep disturbance, disturbance of tranquillity, ability to communicate or concentrate, or participate in social and community activities. Noise-sensitive locations are defined within the Industrial Emissions Licence (IEL) as "*Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance level*s."

Table 9.2 sets out typical classes of sensitive receptors and classification of noise sensitivity respectively. Most receptors or NSLs likely to be affected by the noise and vibration effects arising from the proposed development are dwellings and are therefore considered high sensitivity.

Table 9.2: Criteria of Sensitivity

Sensitivity	Criteria
High	Receptors where occupants or activities are particularly susceptible to noise. Examples include: Residences, quiet outdoor areas used for recreation, conference facilities, auditoria/studios, schools in daytime, hospitals/residential care homes and religious institutions e.g. churches or mosques.
Medium	Receptors moderately sensitive to noise, where it may cause some distraction or disturbance. Examples include offices, restaurants and sports grounds where spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. golf or tennis).

[106] Electricity Supply Board (Moneypoint) - P0605-04 (epa.ie) [Last accessed 03 November 2023]

[107] International Organization for Standardization (ISO) 9613-2 (1996) Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation

Sensitivity	Criteria
Low	Receptors where distraction or disturbance from noise in minimal. Examples include residences and other buildings not occupied during working hours, factories and working environments with existing high noise levels and sports grounds where spectator noise is a normal part of the event.

Source: Mott MacDonald

9.3.2.7 Significance of Effect

Environmental assessment regulations require that the assessment considers the significance of effects on noise and vibration sensitive receptors resulting from predicted noise and vibration impacts. Significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns. The significance of effect criteria applied to this project, in accordance with EPA Guidelines 2022, is reproduced in Table 9.3.

Table 9.3: EIAR Guidelines Significance Description

Significance of Effect	Description
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

These effects can be temporary or permanent in nature, indirect, or cumulative in nature.

Construction

British Standard 5228[101] has been adopted for the assessment of effects at noise sensitive receptors[108] during construction. Based on the BS 5228 Part 1 'Example method 2 – 5 dB(A) change' in BS5228 Part 1 2009+A1:2014, noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,\,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect.

BS 5228-2:2009+A1:2014 explains that even when vibration due to construction activity is very low in magnitude, this can be perceptible to the occupants of nearby buildings. Nuisance associated with vibration is frequently associated with the assumption that if vibration can be felt then building damage is inevitable. Considerably greater levels of vibration over the threshold of perception are however required before damage to buildings at either a cosmetic or structural level will occur. BS 5228-2:2009+A1:2014 presents the following guidance on the effects of vibration with regards to human response:

[108] Residential buildings, hotels and hostels, buildings in religious use, buildings in educational use and buildings in health and/or community use.

- 0.14 mm/s: Vibration may just be perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies people are less sensitive to vibration.
- 0.3 mm/s: Vibration might just be perceptible in residential environments.
- 1.0 mm/s: It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior notification and explanation has been given to residents.
- 10 mm/s: Vibration is likely to be intolerable for any more than a brief exposure to this level in most building environments.

BS 5228-2:2009+A1:2014 states that low frequency vibration at a ppv of 15 mm/s may cause cosmetic damage in un-reinforced or light framed structures e.g. for residential/light commercial use, and 50 mm/s in heavy commercial buildings. These values apply to transient vibration which does not induce a resonant response in structures and low-rise buildings. A source of continuous low frequency vibration may induce a vibration response in buildings or structures at their resonant frequencies. The building would then be subject to additional dynamic forces arising from its own motion. Therefore, BS 5228–2:2009+A1:2014 recommends that the values given should be reduced by 50% to take into account for dynamic magnification due to resonances. Applying a reduction of 50% to the lowest values in BS 5228–2:2009+A1:2014 gives:

- 7.5 mm/s for residential and light commercial buildings; and
- 25 mm/s for industrial and commercial buildings.

The Standard also states: "*Important buildings which are difficult to repair might require special consideration on a case-by-case basis. A building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive*."

It is concluded that a significant adverse effect is expected to arise where the level of ground-borne vibration at a receptor location due to the construction of the proposed development exceeds:

- 1 mm/s with regards to the disturbance of building occupants
- 7.5 mm/s with regards to potential (cosmetic) damage to buildings

Operation

The assessment identifies that there is potential for significant adverse effect to arise when the proposed development results in operational noise impacts at NSLs that exceed:

- 55 dB(A) L_{eq} during the daytime (07:00 to 19:00) free field
- 50 dB(A) L_{eq} during the evening (19:00 to 23:00) free field
- 45 dB(A) L_{eq} during the night-time (23:00 to 07:00) free field for any thirty-minute period

These correspond with the 'Typical limit values for noise for licenced sites' as given in the NG4 Guidance and would also indicate compliance with the limit values given in the IEL for the existing power plant.

Where the predicted noise impacts exceed these values, the final significance of effect shall be considered with regard to:

- Sensitivity of receptor
- Whether the impact is temporary (construction-related) or short-term (operational)
- The magnitude by which the limit value is exceeded

- The change in ambient noise levels as a result of the contribution of the proposed development

It is assumed that operational noise includes no significant tonal or impulsive features and therefore correction of daytime and evening noise levels to represent rating levels.

Summary of Significance of Effect Criteria

Table 9.4 summarises the significance of effect criteria applied within this assessment.

Table 9.4: Significance of Effect

Category	Significance of effect
Construction vibration	Disturbance of building occupants: Exceedance of 1.0 mm/s for a period of 10 or more days of working in any 15 consecutive days is considered to be a significant effect Building damage: Exceedance of 7.5 mm/s
Construction noise	Exceedance of the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect
Changes in road traffic noise during construction	A significant effect is considered to occur where the predicted temporary increase in daily average road traffic noise due to the proposed development is 1 dB or more
Operational Noise	A significant effect is considered to occur where the specified day or night time levels are exceeded at a residential property with the scheme with a minor noise increase (or higher); or where the WHO levels are exceeded at a residential property with the scheme with a major noise increase

9.3.3 Study Area

The study area is defined as 500m from the red line boundary of the proposed development for construction and operational noise impacts, and 100m for construction vibration impacts. Locations within the study area have been identified that are sensitive to noise and vibration. These are residential properties and reported as NSLs as described in the Section 9.4.

9.3.4 Limitations of this EIAR

The specific inventory of plant and working methods to be applied during the construction phase will be devised by the appointed contractor. The construction contractor is not yet appointed therefore, these specific details are not available to inform the assessment of potential noise and vibration impacts. However, the assessment has been undertaken based on the impacts of construction activities that are expected to be required. The construction activities are chosen to represent a reasonable worst-case scenario. It is assumed that the majority of works can be undertaken during weekday daytime periods and that works during the night-time would only be undertaken by exception.

9.4 Receiving Environment

9.4.1 Site Location

The site is located approximately 4km southeast of Kilrush, Co. Clare, on the northern shore of the Shannon Estuary, the site location is provided in Figure 1.1. Most of the site lies to the south of the N67 road, which links Kilrush in the west with Killimer to the east of the site. Moneypoint Generating Station is situated in the townlands of Carrowdotia North, Carrowdotia South and Ballymacrinan. Surrounding land use is predominantly agricultural with isolated residential properties.

9.4.2 Noise Monitoring

The assessment references the results noise monitoring undertaken between 2017 and 2023 to describe baseline conditions affecting the closest NSLs considered by the assessment. Noise levels representing the selected receptors NSL1 to NSL5 at Carrowdotia that are located to the north and northeast of the proposed development are represented by the annual environmental noise monitoring reports of June 2022[109] and January 2023[110]. The measurements were carried out over thirty-minute intervals. The receptors NSL6 to NSL8 at Ballymacrinan that are located to the northwest of the proposed development are represented by the noise monitoring report from 2017[111], which is based on a 10-week long-term measurement. The NSLs and measurement locations are indicated in Figure 9.1 and a summary of baseline noise levels is given in Table 9.5. Table 9.6 provides description of each of the NSL.

Table 9.5: Summary of baseline noise survey results

Receptor	Representative measurement location	Noise level [Average level], L_{Aeq} dB			Noise level [Average level], L_{A90} dB			Remarks
		Day	Evening	Night	Day	Evening	Night	
NSL1	NM1	45-71 [63]	45-47 [46]	28-40 [37]	33-36 [35]	31-36 [34]	24-37 [33]	[a]
NSL2a	NM2	44-49 [46]	47-48 [47]	42-46 [43]	34-39 [38]	34-39 [37]	38-40 [39]	[a]
NSL2b	NM2	44-49 [46]	47-48 [47]	42-46 [43]	34-39 [38]	34-39 [37]	38-40 [39]	[a]
NSL3	NM3	42-51 [48]	42-47 [45]	26-48 [43]	34-41 [39]	28-42 [39]	24-42 [38]	[a]
NSL4	NM2	44-49 [46]	47-48 [47]	42-46 [43]	34-39 [38]	34-39 [37]	38-40 [39]	[b]
NSL5	NM1	45-71 [63]	45-47 [46]	28-40 [37]	33-36 [35]	31-36 [34]	24-37 [33]	[c]
NSL6	NM4	30-49 [38]	30-49 [38]	32-47 [36]	28-47 [36]	28-47 [36]	30-45 [34]	[d] [e]
NSL7	NM4	30-49 [38]	30-49 [38]	32-47 [36]	28-47 [36]	28-47 [36]	30-45 [34]	[d] [e]
NSL8	NM4	30-49 [38]	30-49 [38]	32-47 [36]	28-47 [36]	28-47 [36]	30-45 [34]	[d] [e]

Remarks:

[a] Based on Environmental noise monitoring report June 2022 (report ref DC2229-01) and January 2023 (report ref DC2287-01) by Allegro acoustics

[b] referenced to the noise data at NSL2a and NSL2b due to close proximity

[c] referenced to the noise data at NSL1 due to close proximity

[d] Based on Moneypoint wind farm compliance noise monitoring Oct 2017 by AWN consulting (ref. DK/17/9575NR02a)

[e] Measurement period daytime and evening periods are assumed the same and L_{Aeq} value is 2 dB higher than L_{A90} value.

[109] Moneypoint Generating Station, Environmental noise monitoring, Allegro acoustics, DC2229-01, June 2022

[110] Moneypoint Generating Station, Environmental noise monitoring, Allegro acoustics, DC2287-01, January 2023

[111] Moneypoint Wind Farm compliance noise monitoring, AWN Consulting, DK/17/9575NR02a, Oct 2017

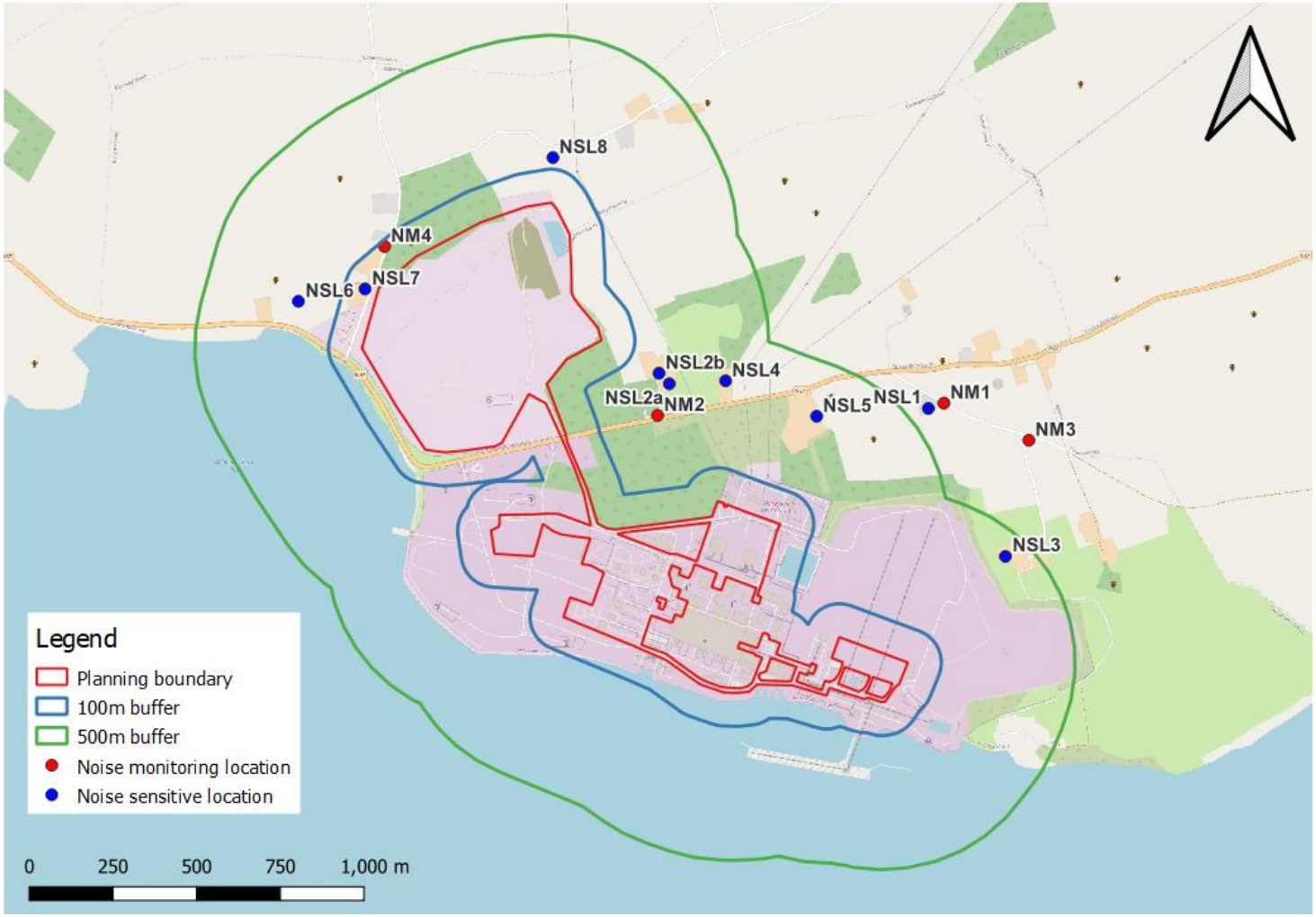
The dominant source of noise affecting the baseline noise climate were identified as:

- Road traffic on local roads and N67 national road
- Distant, noticeable noise from the Moneypoint Generating Station during the night-time when background noise is low.

Table 9.6: Description of Noise Sensitive Locations

Receptor	No. of receptors represent	Description
NSL 1	7	NSLs at the north east of the site at N67
NSL 2a	1	NSL at the north of the site at N67
NSL 2b	1	NSL at the north of the site at N67
NSL 3	3	NSLs at the east of the site
NSL 4	1	NSL at the north of the site at N67
NSL 5	1	NSL at the north of the site at N67
NSL 6	5	NSLs at the west of the landfill site
NSL 7	3	NSLs at the north west of the landfill site

Figure 9.1: Noise Sensitive Locations and Noise Monitoring Locations



Source: Mott MacDonald and © OpenStreetMap contributors

The background noise levels expressed as L_{A90} dB given in Table 9.5 exceed the screening criteria for Areas of Low Background Noise given in the NG4 Guidance. This confirms that the NSLs are within areas that would not be identified as Quiet Areas.

Consequently, this also confirms that the General Noise Criteria defined in the NG4 Guidance are applicable rather than the Quiet Area Noise Criteria.

The compliance records for the past three years of the extant Industrial Emissions licence P0605-04 have been reviewed, there has been one complaint about noise during the night-time (September 2023) and the case has been closed.

9.5 Likely Significant Effects

Operational and construction noise levels due to the proposed development have been calculated at NSLs as presented in Section 9.4. The NSLs all lie within the study area for the assessment except NSL1, however, as this receptor is located close to the Moneypoint Generating Station site boundary at north east, this will be included in the assessment.

9.5.1 Do Nothing

In the event that the proposed development does not proceed, there would be no construction activities and new additional operation noise sources, so the existing noise and vibration from the site would remain at current levels. Therefore, the ‘do nothing’ scenario will have no impact on noise and vibration.

9.5.2 Construction Phase

9.5.2.1 Calculation Methodology

British Standard 5228 has been adopted for the assessment of effects at noise sensitive receptors during construction, the calculation details are provided in the Appendix F.1.

9.5.2.2 Construction Noise

An indicative list of construction plant is presented in Table 9.7 and has been compiled from the inventories for similar projects and through consultation with the project team. Reference Sound Pressure Levels (SPL) for continuous operation are presented. The level of noise emission is corrected for utilisation time based on the estimated percentage of time the plant is expected to be in use over a working day.

Table 9.7: Details of noise-emitting equipment considered for the construction of the proposed development and reference noise levels used for noise calculations

Phase	Activity	Plant item	BS5228 Reference	Qty	Utilisation %	$L_{Aeq,10m}$ dB	Corrected combined $L_{Aeq,10m}$ dB
Construction of new HFO Tanks and civil works	HFO base civil works, HFO bund walls and floors	Tracked excavator 21t	C.2.3	1	50	78	85
		Dozer D6	C.2.12	1	50	81	
		Articulated dump truck 30t	C.2.32	1	50	74	
		Grader	C.6.31	1	25	86	
		Smooth drum roller 13t	C.5.21	1	25	80	
		Sheepsfoot/tamping roller 13t	C.5.21	1	25	80	
		Concrete mixer truck	C.4.27	1	25	79	
		Cement spreader	C.4.18	1	25	75	
		Cement mixer	C.4.24	1	25	67	
	HFO tanks construction	Tracked excavator 21t	C.2.3	1	25	78	81
		Articulated dump truck 30t	C.2.32	1	25	74	
		Mobile telescopic crane, 315kW, 80t	C.4.39	1	50	77	
		Diesel scissor lift, 24kW, 6t	C.4.59	1	50	78	
		Tracked excavator, 95kW 21t	C.4.65	1	50	71	
		Disc cutter	C.5.36	1	10	87	
	Material delivery	Articulated dump truck 30t	C.2.32	1	75	74	78
		Dumper 5T	C.4.7	1	75	78	
Construction of new auxiliary steam boilers	Site preparation	Tracked excavator	C.2-14	1	25	79	78
		Dozer	C.2-10	1	25	80	
		Wheeled backhole loader	C.2-8	1	50	68	
		Concrete pump and cement mixer truck discharging	C.4-24	1	25	67	
		Poker vibrator	C.4-34	1	25	69	
		Wheeled backhoe loader	C.2-8	1	50	68	
		Tracked mobile crane	C.4-50	1	25	71	
		Cement spreader	C.4.18	1	25	75	
		Cement mixer	C.4.24	1	25	67	
		Power for welder - diesel generator	C.4-85	1	75	66	
	Piling works	Tracked excavator	C.2-14	2	25	79	86
		Dozer	C.2-10	1	25	80	
		Large rotary bored piling rig	C.3-14	1	25	83	
		Tracked drilling rig with hydraulic drifter	C.3-15	1	25	82	
		Compressor for mini piling	C.3-19	1	25	75	
		Hydraulic hammer rig	C.3.1	1	25	89	
		Tracked excavator 21t	C.2.3	1	25	78	80

Phase	Activity	Plant item	BS5228 Reference	Qty	Utilisation %	$L_{Aeq,10m}$ dB	Corrected combined $L_{Aeq,10m}$ dB
	Auxiliary boiler house construction	Articulated dump truck 30t	C.2.32	1	25	74	
		Disc cutter	C.5.36	1	10	87	
		Mobile telescopic crane	C.4-39	1	50	77	
		Cement spreader	C.4.18	1	25	75	
		Cement mixer	C.4.24	1	25	67	
		Power for welder - diesel generator	C.4-85	1	75	66	
	M&E construction	Telescopic handler	C.2.35	2	25	65	78
		Tracked mobile crane	C.4-50	2	50	71	
		Compressor	D.7-10	1	75	78	
		Tractor (towing trailer)	C.4.74	1	25	73	
	Commissioning of all newly installed electrical equipment	Lifting platform, 8t	C.4-57	2	50	67	72
		Diesel generator	C.4-86	1	100	65	
		Water pump (diesel)	C.4-88	1	100	68	
Construction of the ash injection plant and batching plant modification	Site preparation work	Tracked excavator	C.2-14	1	25	79	74
		Tracked mobile crane	C.4-50	1	25	71	
	Modification to the batching plant and Modification to the ash injection plant	Tracked excavator 21t	C.2.3	1	25	78	80
		Articulated dump truck 30t	C.2.32	1	25	74	
		Disc cutter	C.5.36	1	10	87	
		Mobile telescopic crane	C.4-39	1	50	77	
		Cement spreader	C.4.18	1	25	75	
		Cement mixer	C.4.24	1	25	67	
		Power for welder - diesel generator	C.4-85	1	75	66	
	Commissioning	Lifting platform, 8t	C.4-57	1	50	67	71
		Diesel generator	C.4-86	1	100	65	
		Water pump (diesel)	C.4-88	1	100	68	
Partial coalyard dismantling [1]	Removal of coal handling plant and dismantling of associated buildings with the removal of structures to ground level	Telescopic handler	C.2.35	2	25	65	81
		Tracked mobile crane	C.4-50	2	25	71	
		Gas cutter (cutting top of pile)	C.3.34	2	25	68	
		Disc cutter	C.5.36	1	25	87	
	Material delivery	Articulated dump truck, 194kW, 25t	C.4.1	2	50	81	81

Remarks: [1] This will not occur during the construction phase but several months after the new utilities are built and commissioned.

Source: Mott MacDonald

The sources of noise are assumed to be evenly distributed across the site at locations adjacent to site components scheduled for construction. The calculation of construction noise has accounted for buildings providing screening. Normal working hours during the construction period are expected to be Monday to Friday 07:00 to 19:00 hours and 08.00 to 14.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours, but they will be limited to inspection, testing and if necessary, emergency.

Neither of the example methods in BS 5228 specified in Annex E 'Significance of Noise Effects' align with requirements set by the Environmental Protection Agency and as a result have not been considered as methods for deriving the definition of a significant adverse effect. The definition of a significant adverse effect is specified in Chapter 5 of this EIAR.

Table 9.8: Construction noise levels at NSLs due to the proposed development

Phase	Activity	Predicted noise level, dB L_{Aeq}								
		NSL 1	**NSL 2a**	**NSL 2b**	**NSL 3**	**NSL 4**	**NSL 5**	**NSL 6**	**NSL 7**	**NSL 8**
Construction of new HFO tanks and civil works	Civil works	46	49	48	44	50	51	37	38	39
	HFO tanks construction	43	46	45	41	46	48	34	35	36
	Material delivery	40	43	42	38	43	45	31	32	33
Construction of new auxiliary steam boilers	Site preparation	35	39	39	35	39	39	31	32	32
	Piling works	43	46	46	42	46	46	38	39	39
	Auxiliary boiler house build	37	41	41	37	41	40	33	34	34
	M&E construction	35	39	38	35	38	38	31	32	31
	Commissioning	29	32	32	28	32	32	24	25	25
Construction of the ash injection plant and batching plant modification	Site preparation	33	35	34	33	35	36	27	27	27
	Modification to batching plant and ash injection plant	39	41	41	40	42	42	33	33	34
	Commissioning	30	32	31	30	32	33	24	24	25
Partial coalyard dismantling [1]	Removal of coal handling plant and dismantling of associated buildings	40	38	38	46	39	41	32	32	33
	Material delivery	40	38	38	45	39	41	32	32	33
Significant adverse effect		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Remarks: [1] This will not occur during the construction phase but several months after the new utilities are built and commissioned.

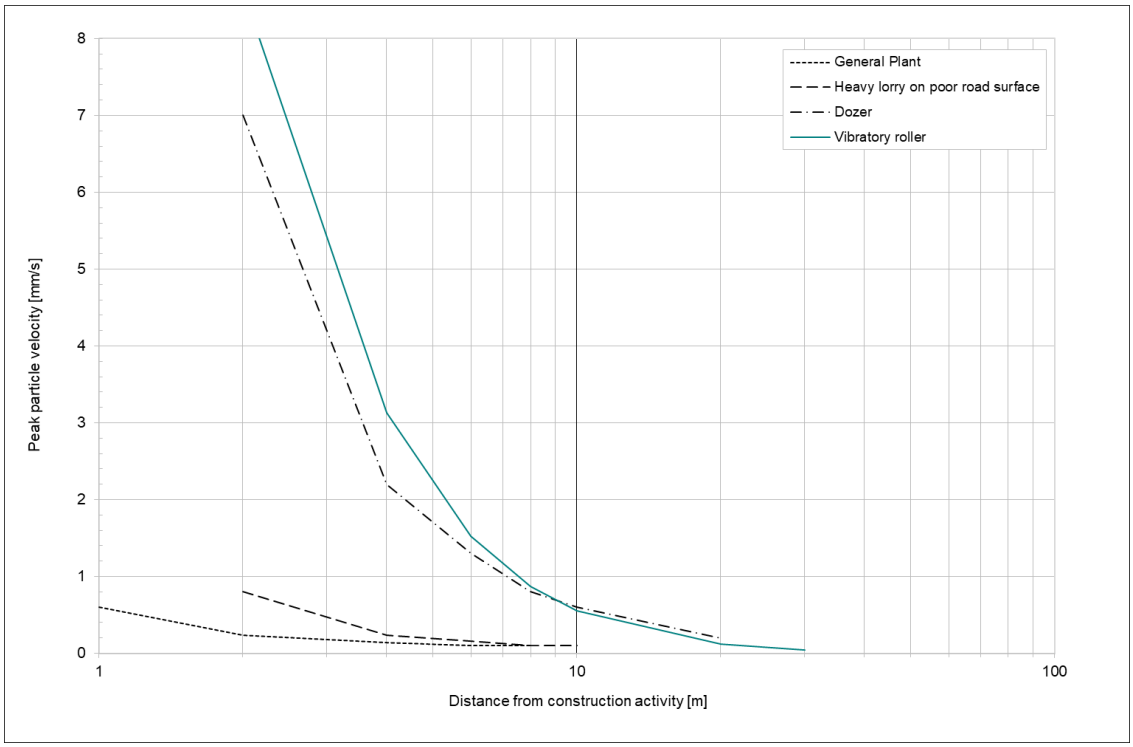
Source: Mott MacDonald

The results of the calculations indicate that predicted noise levels at the NSLs due to the construction of the proposed development are below the daytime criterion of 65 dB L_{Aeq} and evening criterion of 55 dB L_{Aeq}. Therefore, it is concluded that the significance of effect due to construction noise is Not Significant.

9.5.2.3 Construction Vibration

Figure 9.2 presents levels of ground-borne vibration for various types of construction activities as a function of distance from the activity. This shows that vibration from general activity is not expected to result in perceptible levels of vibration beyond ~20 to 30m distance. All NSLs are more than 100m away from the nearest site boundary, except NSL6, NSL7 and NSL8 where it is not anticipated to have any construction activity with using dozer or vibratory roller.

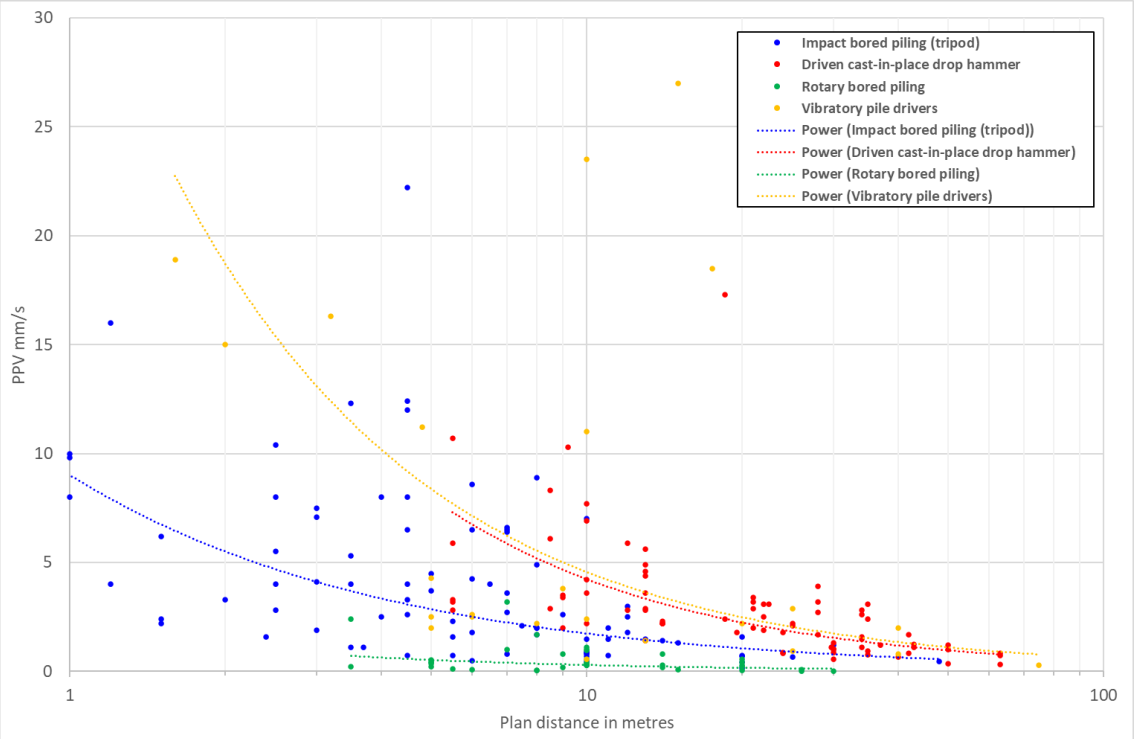
Figure 9.2: Empirical data on ground-borne vibration from general construction works



Source: Mott MacDonald

It is not known at this stage whether piling will be required or the preferred method. BS 5228-2:2009+A1:2014 presents case history data for the levels of vibration for various types of piling expressed as peak particle velocity. Figure 9.3 presents data for impact, driven, rotary and vibratory piling as a function of plan distance.

Figure 9.3: BS 5228-2:2009+A1:2014 case history data on vibration from piling



Source: Mott MacDonald

With reference to Figure 9.3, this shows that vibration due to most types of piling is not expected to exceed 1mm/s if the works are undertaken at 100m from the NSLs. It would therefore be unlikely to be perceptible or cause complaint. The likelihood of cosmetic or structural damage is also very low. Potential disturbance can be avoided by giving prior notification and careful timing of activities to avoid sensitive times of the day. However, as distance of the foundation of the Auxiliary Boiler to all NSLs is at least 500m, the significant effects due to the potential piling work is considered not likely.

It is concluded that vibration due to construction activity has a very low likelihood to cause complaint, cosmetic or structural damage. The significant effects of vibration due to construction activity and piling work are not likely. The impacts at all other NSLs are not predicted to exceed thresholds of perception.

The results of the calculations indicate that predicted levels of vibration fall below the thresholds for the disturbance of occupant of buildings and for potential building damage. Therefore, it is concluded that the significance of effect due to construction vibration is Not Significant.

9.5.2.4 Construction Traffic

In order to access the proposed development site, the contractors will be required to utilise a local public road that adjoins the N67 and N68 roads.

Traffic data for the N67 road between Kilrush Ferry and Kilrush and the N68 road between Ennis and Kilrush have been considered for the assessment. The ‘Do nothing’ traffic data (without the implementation of the proposed development) for year 2025, when the peak in construction traffic movements are expected to occur, is based on the traffic data from

Transport Infrastructure Ireland (TII) Traffic Data Site (https://trafficdata.tii.ie) taking in to account the growth factor given in Table 6.2 of the TII publication PE-PAG-02017 [112].

It is estimated that in year 2025, the total daily 18-hour traffic flows (06:00 to 24:00) on the N67 and N68 roads are 1,389 and 4,202 vehicles with an average of 5% and 4% of Heavy Goods Vehicles (HGVs) respectively.

This shows that the predicted increase in the Basic Noise Level for road traffic noise (L_{10} dB(A)), based on the daily average road traffic parameters for the N67 and N68 roads in the year 2025 and forecasted additional movements, are +1.0 dB and +0.3 dB respectively. The estimation is based on the peak traffic month of Light Goods Vehicles (LGVs) and HGVs respectively and assumes all additional traffic would access the N67 or N68 as a worst case. Therefore, although there is a predicted +1.0 dB increase for N67 under this worst case scenario, it is concluded that the likely significance of effect due to construction traffic is Not Significant.

Table 9.9: Analysis of traffic data and changes in basic noise levels

		18-hour daily average traffic 2-way traffic movements			
		N67		N68	
		Do nothing 2025	During construction 2025	Do nothing 2025	During construction 2025
Light vehicles	Baseline	1,319		4,035	
	Additional LGVs	-	103	-	103
	Total light vehicles and LGVs	1,319	1,422	4,035	4,138
Heavy vehicles	Baseline	70		167	
	Additional HGVs	-	33	-	33
	Total HGV	70	103	167	200
Total vehicles		1,389	1,525	4,202	4,338
% HGVs		5.0	6.8	4.0	4.6
Basic Noise Level L_{10} dB(A)		60.6	61.6	66.8	67.1
Predicted increase in the Basic Noise Level dB			+1.0		+0.3

Source: Mott MacDonald

9.5.3 Operation and Maintenance Phase

9.5.3.1 Operational Noise

The operational noise assessment implements the procedures of ISO 9613-2[113] using a three-dimensional acoustic model developed using DataKustik CadnaA software. The detail of the calculation methodology and assumptions are provided in Appendix F.2.

The basic formula of the noise model to predict the noise level for each noise source is given below:

$$L_{fT}(DW) = L_w + D_c - A$$

[112] TII Publications, Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, PE-PAG-02017, October 2021

[113] ISO 9613 (1996) Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'.

Where

$L_{fT}(DW)$ is the equivalent continuous downwind octave-band sound pressure level at a receiver location in dB

L_w is the octave-band sound power level in dB, re 1pW

D_c is the directivity correction in dB

A is the octave-band attenuation in dB

The attenuation term A is given as follows:

$$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc}$$

Where

A_{div} is the attenuation due to geometrical divergence in dB

A_{atm} is the attenuation due to atmospheric absorption in dB

A_{gr} is the attenuation due to ground effect in dB

A_{bar} is the attenuation due to a barrier in dB

A_{misc} is the attenuation due to miscellaneous other effects in dB, such as the attenuation due to propagation through foliage, an industical site or a built-up region of houses.

Sound reflections are also considered by using image sources method. The overall noise level at each of the NSL are then calculated by logarithmic additions of all octave-band as well as all considered noise sources.

A list of operational noise sources is presented in Table 9.10 and the steady state sound power levels (SWL) that have been applied within the acoustic model. The item numbers correspond to the equipment layout presented at Figure 9.4. The noise emission data of plant items for the proposed development have been obtained for plant items specified within other similar projects and with similar specifications. It is assumed that all plant will operate continuously with no significant tonal or impulsive features.

Table 9.10: List of noise sources considered within the acoustic model for the operation of the proposed development[114]

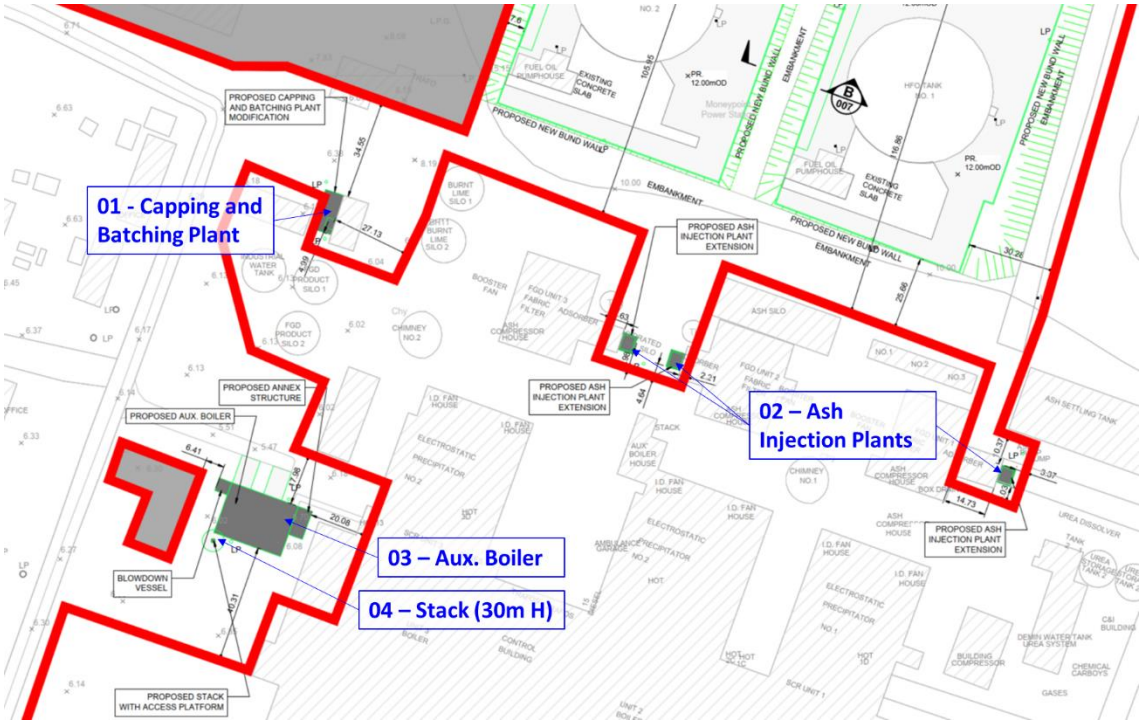
Item #	Description	Number of items	Sound power level dB(A)
01	Capping material batching plant	1	104
02	Ash injection plant	3	104
03	Auxiliary boiler	2	89
04	Auxiliary boiler stack at 30m hight with assumption of 25 m/s of exhaust velocity and 265 °C exhaust temperature	1	92
05	Reprofiling of Ash storage area	1	96 [1]

Remark [1]: evenly distributed at the

Source: Mott MacDonald

[114] Sound power levels obtained from the Mott MacDonald database for representative items of equipment.

Figure 9.4: Site layout of the proposed development



Source: ESB, Proposed site layout Sheet 2 of 6, Drawing number: QP-000017-65-D451-006-002-000, December 2023

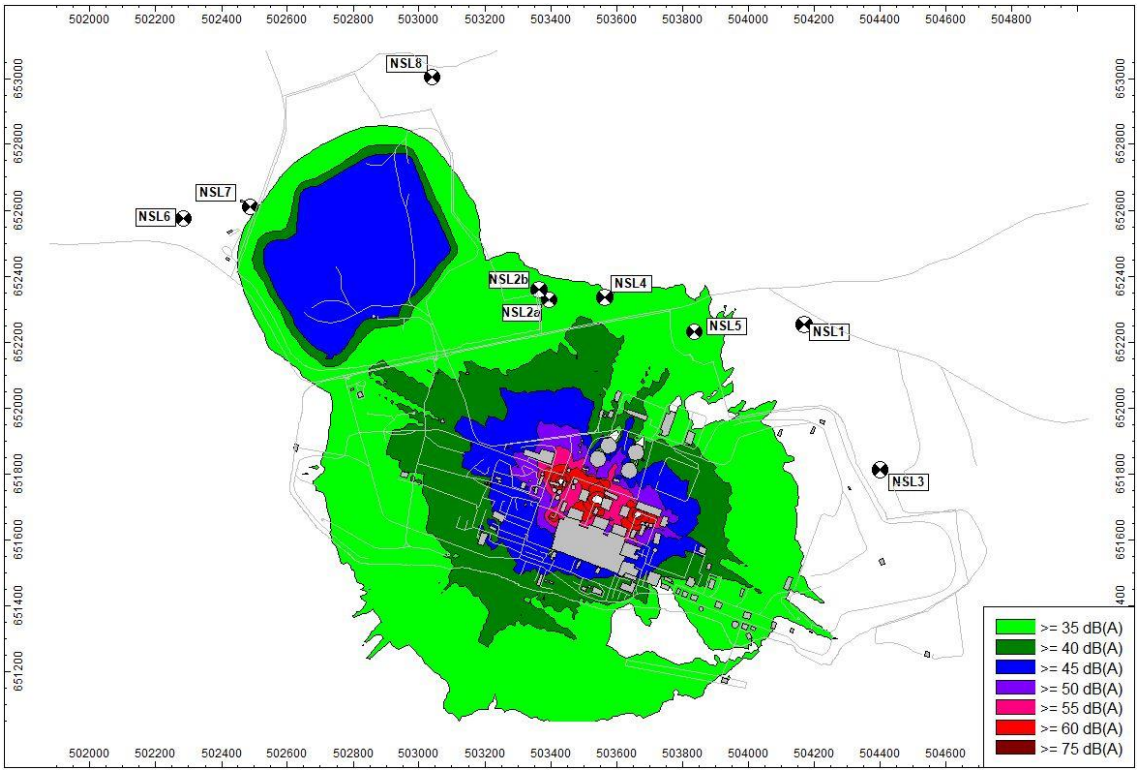
The predicted operational noise levels for each NSL are presented in Table 9.11. A noise contour plot produced by the acoustic model is presented in Figure 9.5.

Table 9.11: Predicted operational noise levels NSLs due to the proposed development

Noise Sensitive Location	Predicted noise level, dB L_{Aeq}	Significant adverse effects	Night time baseline noise, dB L_{Aeq}	Predicted overall noise, dB L_{Aeq}
NSL1	31	No	37	38
NSL2a	37	No	43	44
NSL2b	36	No	43	44
NSL3	32	No	43	43
NSL4	36	No	43	44
NSL5	36	No	37	40
NSL6	30	No	36	37
NSL7	35	No	36	39
NSL8	31	No	36	37

Source: Mott MacDonald

Figure 9.5: Contour plot of predicted operation noise levels



Source: Mott MacDonald

The predicted operational noise levels at the NSLs in Carrowdotia and Ballymacrinan due to the proposed development are below the criterion given in the NG4 guidance of 45 dB L_{Aeq} for the night-time, 50 dB L_{Aeq} for evening and 55 dB L_{Aeq} for daytime. Therefore, it is concluded that the impact due to operational noise is Not Significant.

When unloading the coal ships, the operations of the coal yard normally operate continuously for two to three weeks. The noisy activities associated with this operation include unloading of coal ships, coal conveyors, stacker reclaimers, and ship cranes. However, this operation will cease once the coal stocks are depleted and it will be partially dismantled to allow enabling works for the Green Atlantic @ Moneypoint project. Although the closest receptor to the above activities (NSL3) is at more than 500m distance, the end of coal yard operations would have slight benefit to the NSLs in terms of operational noise level.

9.5.4 Decommissioning Phase

On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and IE licences, unless otherwise authorised. Specific details on decommissioning are not available at this stage of the project. Impacts during decommissioning from airborne noise and ground-borne vibration due to dismantling activities are expected to be of a similar magnitude to those during construction but generally of shorter duration. Therefore, it is concluded that the noise and vibration impacts due to decommissioning are Not Significant.

9.6 Cumulative Effects

The cumulative effects for the operational noise have been considered. The existing environment at NSLs including existing industrial noise at the site with wind turbine operations and road traffic noise have been considered. Table 9.12 shows the cumulative noise levels have included the baseline conditions. It is indicated that the increase of the noise levels at NSLs with the consideration of the proposed development is in a range of 0 to 2.7 dB. This increase is small and imperceptible at the NSLs in general and it is concluded that the significance of effect due to cumulative impacts is Not Significant.

Table 9.12: Cumulative noise levels with baseline conditions

Noise Sensitive Location	Predicted operational noise level dB(A)	Measured existing noise level, dB $L_{Aeq,T}$			Cumulative noise level, dB $L_{Aeq,T}$			Increase, dB		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
NSL1	31	56	46	37	55.8	46.0	38.1	0.0	+0.1	+1.0
NSL2a	37	63	55	53	62.6	54.6	53.5	0.0	+0.1	+0.1
NSL2b	36	63	55	53	62.6	54.6	53.5	0.0	+0.1	+0.1
NSL3	32	43	43	37	43.4	43.5	37.7	+0.3	+0.3	+1.2
NSL4	36	63	55	53	62.6	54.6	53.5	0.0	+0.1	+0.1
NSL5	36	56	46	37	55.9	46.3	39.8	0.0	+0.5	+2.7
NSL6	30	38	38	36	38.7	38.7	37.1	+0.7	+0.7	+1.1
NSL7	35	38	38	36	39.9	39.9	38.7	+1.9	+1.9	+2.7
NSL8	31	38	38	36	38.7	38.7	37.1	+0.7	+0.7	+1.1

Source: Mott MacDonald

In addition to the proposed development, there is additional project proposed in the vicinity of Moneypoint Generating Station site. Table 9.13 describes the proposed project.

Table 9.13: Other proposed development in the vicinity of the proposed development

Planning Reference	Description	Date Granted
ABP: 307798-20	Proposed 400kV electricity transmission cables, extension to the existing Kilpaddoge Electrical Substation and associated works, between the existing Moneypoint 400kV Electrical Substation in the townland of Carrowdoita South County Clare and existing Kilpaddoge 220/110kV Electrical Substation in the townland of Kilpaddoge County Kerry. The development includes work in the foreshore.	June 2021

Source: Mott MacDonald

The planning reference of ABP: 307798-20 regarding the proposed 400kV electricity transmission cables and associated works, the inspector's report of October 2020[115] indicates that the predicted operational noise at the NSLs is in the range of 24 to 30 dB(A) which is less than the background noise levels and therefore an adverse impact is not considered likely. Construction noise is expected during the construction stage; however, the cumulative impacts would depend on the construction schedule of this proposed work and the proposed development at Moneypoint Generating Station.

[115] An Bord Pleanala, Inspector's Report ABP-307798-20, October 2020

9.7 Mitigation and Monitoring Measures

No specific mitigation measures and monitoring measures are proposed for the mitigation of construction or operational noise impacts at off-site sensitive receptors.

The following measures will adhere to the British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, 2009 + A1:2014 and British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites –Part 2: Vibration, 2009 + A1:2014. Noise emissions will be minimised at source, in accordance with best practice, to minimise the exposure site personnel to noise from construction and operational plant. However, the existing ELVs and monitoring as required under the IEL will be continued.

A Construction Environmental Management Plan (CEMP) is also included in Appendix C of this EIAR. The CEMP will be implemented during the construction phase to minimise any construction noise and vibration impacts. A CEMP will be implemented during the construction phase in consultation with Clare County Council. The contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to) the setting of limits for the control of noise and vibration from construction activities, the provision of mitigation measures required whilst adopting best practicable means, and any noise or vibration monitoring where significant adverse effects are required to be monitored. A comprehensive noise and vibration monitoring protocol will also be implemented. As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction.

9.8 Residual Impacts

The proposed development at the Moneypoint Generating Station is expected to generate noise during both the construction and operational stages, and vibration during construction.

The assessment has considered the likelihood of significant effects based on predictions of noise where the noise emissions of construction and operational plant have been assumed.

The noise or vibration sources of the proposed development is located at least 300m from the nearest dwellings in the townlands of Carrowdotia North, Carrowdotia South and Ballymacrinan. As a result, the distance between site and noise sensitive is sufficient such that the significance of effect due to residual impacts is Not Significant.

10 Biodiversity

10.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on biodiversity and the wider ecological environment which could potentially be affected. The assessment is based on the development as described in Chapter 4 of this Environmental Impact Assessment Report (EIAR).

Biodiversity (or "biological diversity"), as defined at the United Nations Convention on Biological Diversity (CBD), is *'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes genetic diversity within species, between species and of ecosystems'.*

Mitigation measures are provided to avoid / reduce significant effects on biodiversity receptors and residual effects are determined.

10.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the biodiversity impact assessment are set out in this section.

10.2.1 Legislation and Policies

In assessing the likely significant effects on biodiversity arising from the proposed development, due regard has been given to relevant legislation and guidance, including the following:

- Planning and Development Act 2000, as amended
- EIA Directive (2014/52/EU)
- EU Habitats Directive (92/43/EEC)
- EU Birds Directive 2009/147/EEC
- EU Water Framework Directive 2000/60/EC
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)
- Wildlife Act 1976, as amended
- Flora (Protection) Order 2022
- Clare County Development Plan 2017-2023
- Interim Version of the Clare County Development Plan 2023-2029
- County Clare Biodiversity Action Plan 2017-2023
- National Biodiversity Action Plan 2017 - 2021
- Ireland's 4th National Biodiversity Action Plan (draft for Public Consultation)
- Clare County Heritage Plan 2024-2030
- All-Ireland Pollinator Plan 2021-2025

10.2.2 Guidelines

This assessment has been carried out having regard to relevant guidance documents including the following:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.2 [Chartered Institute of Ecology and Environmental Management (CIEEM), 2018, updated April 2022]
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (EPA, 2022)
- Biodiversity Net Gain. Good practice principles for development. A practical guide. (CIRIA C776a, 2019)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union, 2013)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009)
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (National Roads Authority, 2009)
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005)
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008)
- Guidelines for the Treatment of Bats During the Construction of National Road Schemes (National Roads Authority, 2005)
- A Guide to Habitats in Ireland (Fossitt, 2000)
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011)
- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters
- Countryside Bird Survey (2012) CBS Manual Guidelines for Countryside Bird Survey participants
- Bat Surveys: Good Practice Guidelines, Fourth Edition (Bat Conservation Trust, 2023)
- The Bats and Appropriate Assessment Guidelines (Bat Conservation Ireland, 2012)

10.3 Methodology

10.3.1 Desktop Study

A desktop assessment was carried out to identify features of ecological importance with the potential to be affected by the proposed development. The assessment included an interrogation of aerial imagery and available GIS datasets to investigate the potential for connectivity to designated and ecologically sensitive areas. Habitats which might be affected by the development were identified and their suitability to support sensitive, rare and protected species was assessed (having regard to the typical ranges of species known to occur in the locality).

10.3.1.1 Approach to Data Collection

Principal sources of information utilised for the desktop assessment included:

- Existing relevant mapping and databases e.g., species (protected and rare) and habitat distribution etc. (sourced from the Environmental Protection Agency (EPA)[116], the National Biodiversity Data Centre (NBDC)[117] and the National Parks and Wildlife Services (NPWS)[118]
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Article 17 Reports, Species Action Plans and Conservation Management Plans
- Published data from Bat Conservation Ireland
- Published data from BirdWatch Ireland
- Published data from the Botanical Society of Britain & Ireland Database
- Published documents from Marine Institute Ireland
- EPA maps (https://gis.epa.ie/EPAMaps)
- A review of findings of previous ecological surveys undertaken in proximity to the proposed development site was also carried out.

With reference to the last bullet, information from these surveys, the location at which they were undertaken, and their relevance to the proposed project, is provided in Section 10.4.5. These included recent surveys conducted for other projects located within, or immediately adjacent to, the Moneypoint Generating Station. These include:

- Bat assessments
- Marine mammal and seabird surveys
- Marine habitat surveys
- Moneypoint ecological site walkover
- Baseline Ecology Survey by others [10 November 2023]
- Bird Survey by others [10 November 2023]

The following information and data sources have also been considered during the production of this EIAR (Table 10.1).

Table 10.1: Sources and contents

Data source	Data contents
National Biodiversity Data Centre	Protected species records
National Parks and Wildlife Service	Protected species records
National Parks and Wildlife Service	Article 17 Habitats Conservation Assessments 2019 Volume 2
National Parks and Wildlife Service	Article 17 Species Conservation Assessments Volume 3
National Biodiversity Data Centre	Protected species records

10.3.2 Field Survey Methodology

10.3.2.1 Site Survey

Two site surveys were conducted by a Mott MacDonald Ecologist between August and November 2023. The purpose of these surveys was to confirm the habitats located on proposed development.

[116] https://gis.epa.ie/

[117] National Biodiversity Data Centre A Heritage Council Programme, Documenting Ireland's Wildlife (biodiversityireland.ie)

[118] https://www.npws.ie/maps-and-data

Habitats were classified to level three according to the scheme outlined in "*A Guide to Habitats in Ireland*" (Fossitt, 2000) and their fit to European Annex 1 habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) and by having regard to the Irish Vegetation Classification where relevant.

Habitat survey methods were implemented in accordance with '*Best Practice Guidance for Habitat Survey and Mapping*' (Smith et al., Heritage Council, 2011). During site walkovers, searches were conducted for invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended.

Particular attention was also paid to the possible occurrence of:

- Protected plant species listed in the 2022 Flora Protection Order S.I. No. 235/2022
- European Communities (Birds and Natural Habitats) Regulations 2011
- Flowering plants of conservation concern in the Ireland Red List (No. 10): Vascular Plants
- Species and habitats of special conservation significance identified within relevant Biodiversity Action Plans

During this survey, potential habitat for rare and protected invertebrates and flora were also considered, with any incidental sightings of invertebrates and insects recorded.

Signs of mammals were investigated and recorded during the walkover survey and any incidental occurrence of avifauna was also recorded.

An assessment of the likely presence or absence of protected and notable animal species, listed on Annexes II, IV and V of the Habitats Directive was undertaken. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations.

10.3.3 Approach to Impact Assessment

10.3.3.1 Study Area/Zone of Influence (ZoI)

The current guidance on ecological assessments states that: "*The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries*" and that "*the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change*."

The ZoI varies depending on the nature of the various activities associated with the project and the proximity, location and sensitivity of the different receptors (e.g., flora, birds, terrestrial mammals, marine mammals, fish etc.) to the effects produced by the project and encountered by the receptor. In order to establish the ZoI of the Proposed Development, desktop and field survey data on habitats and species was mapped using a Geographic Information System. This data was interrogated for source-pathway-receptor connectivity.

Potential Impacts

The following have been determined to be the potential impacts of the proposed development based on the development description provided by ESB (Chapter 4):

- Construction/Dismantling Works:
  - Habitat disturbance/alteration associated with construction of new HFO tanks and auxiliary boilers.

  - Noise disturbance related to potential piling and proposed construction/installation of new HFO tanks and auxiliary boilers, as well as their associated infrastructure, e.g., bunds, and works to dismantle coal yard structures. Additional noise can also arise from the, temporarily required increase in vehicle movements. Construction noise associated with any piling works required, could affect bird species. Birds using the shoreline for feeding or roosting, might be affected up to 355m from the site. Otters have the potential to be affected up to 150m from the site. These moderate, temporary effects are not likely to result in significant effects as the site is industrial and most fauna using the area are likely habituated to the noise levels on-site.
  - Vibration associated with potential piling, and proposed construction and dismantling works.
  - Dust associated with the dismantling of the coal conveyor bridge and stacker reclaimers in the coal yard, modification of the ash storage area and the continued landfill of ash, construction of the new auxiliary boiler building, two new HFO tanks and ancillary buildings.
  - Visual and general disturbance arising from additional / unusual vehicular movements e.g., oversized loads, additional / unusual tanker movements, e.g., oversized loads and the temporary increase in personnel on site.
  - Increase/change in current lighting arrangements.
  - Possible spills related to concrete batching/casting.
  - Fuel, oil, other chemical spills related to increased traffic, construction work etc
  - Introduction/spread of terrestrial invasive species with construction and dismantling activities and traffic
- Operational/Maintenance Works:
  - Oil spill, resulting from:
    - Grounding of, collision with, or leakage from an oil tanker on approach to Moneypoint, causing a catastrophic oil spill into the estuary.
    - Spillage during offload from tanker to onshore tanks.
    - Spill, leakage from HFO tanks onsite.
  - Introduction/spread of marine invasive species with HFO tankers.
  - Generation of Air pollutants- There is the potential for the generation of airborne pollutants capable of deposition within the wider landscape.
  - Noise and light disturbance: Operational phase noise at the proposed development will not change from the pre-existing levels. The site operates in line with an existing IE licence (Register Number: P0605-04. Changes to and increases from the existing light levels are proposed following installation of additional lights within the proposed development that will run during the operation of the proposed development.
  - Discharges to water. The site operates in line with an existing IE licence (Register Number: P0605-04. It is not proposed to change any of the existing emission limit values in the IE licence. The proposed development will require an update to the existing IE licence from the EPA, namely, to add the proposed auxiliary boiler exhaust stack as an emission point. Ultimately the EPA is the competent authority in relation to the IE licence, emissions and environmental management. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to include the proposed development under the IE licence. Public notification was issued in the Irish Times on the 08 January 2024

It is noted that the Safety Data Sheet (provided by ESB) states that for the HFO, there are no chemical groups associated with explosive properties present in the molecule. Therefore, the likelihood of explosion of HFO tanks is not considered further in this assessment.

The ZoIs identified for various ecological receptors, having regard to the potential impact as outlined previously, is as detailed below:

- **Direct impacts** on terrestrial habitats is within the physical footprint of the proposed development.
- Coastal and marine habitats and species, including Annex II fish species like Salmon (*Salmo salar*) may be impacted up to 120 km from site in case of catastrophic **oil spill** in the estuary. This distance is based on information found in guidance and documents, such as ITOPF Fate of Marine Spills Technical Information Paper 2[119], the Global Marine Oil Pollution Information Gateway[120], information from the press and public sources about well-known and recorded oil spills[121] [122], as well as guidance received from NPWS (letter Ref: G Pre00216/2023, 06/10/2023), and expert advice provided by Mott MacDonald's Senior Associate Marine Ecologist, who is also an 'on-scene commander of oil spills' and who has extensive experience in Oil Spill Contingency Planning (OSCP). 120km has been chosen as a reasonable distance to consider potential impacts on marine and coastal habitats and birds and marine mammals
- Nesting, foraging and feeding wetland and terrestrial bird species, within the local vicinity, may be impacted by **noise** effects[123] for up to 253m from the proposed development site. The noise study (Allegro acoustics[124], Jun 2022 and Jan 2023, respectively), although focussed on waterbirds, found that the construction phase works noise will fall to below 55dB within up to 253m of the proposed development. As such, areas of suitable habitat in the vicinity of works are taken as the ZoI for the construction related noise impacts to all (terrestrial and water) nesting, foraging and feeding birds within the local vicinity.
- Nature Scott Guidance (undated)[125] states 100m for badger setts, for the impacts of **vibration** created by piling and NRA (2006)[126] states 150m for **noise** with regard to breeding badgers
- Studies by the Institute of Air Quality Management (IAQM, 2014; 2016) have indicated that fugitive dust is typically deposited between 50 to 200 m of the source (works), the greatest proportion of which, comprising larger particles (greater than 30 microns) is deposited within 100m. As such, the maximum ZoI is taken as 100m for **dust effects on vegetation**, such as the woodland adjacent to the site, and associated with dismantling of structures in the coal yard, construction related works and traffic within this assessment[127][128].
- 6km for **foraging bats** (Bat Conservation Ireland, 2012)
- 422m for **noise impacts on roosting bats** based on guidance from UK Bat Mitigation Guidelines (2023) and the noise modelling undertaken for the proposed development shows

[119] https://www.itopf.org/fileadmin/uploads/itopf/data/Documents/TIPS_TAPS_new/TIP_2_Fate_of_Marine_Oil_Spills.pdf
[120] http://oils.gpa.unep.org/facts/fate.htm
[121] https://www.treehugger.com/the-largest-oil-spills-in-history-4863988
[122] https://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/oil_and_gas/gulf_oil_spill/a_deadly_toll.html
[123] Cutts. N., Hemingway K., & Spencer J., (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects Version 3.2. Institute of Estuarine & Coastal Studies (IECS), University of Hull.
[124] Moneypoint Generating Station, Environmental noise monitoring, Allegro acoustics reports DC2229-01 and DC2287-01, Jun 2022 and Jan 2023, respectively
[125] Nature Scot (undated) Protected Species Advice for Developers: Badger, A2293028
[126] National Roads Authority (2006). Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes
[127] Holman et al. (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/ text/guidance/construction-dust-2014.pdf.
[128] IAQM (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning. Institute of Air Quality Management, London.

noise will drop to or below 50dB at this distance[129] and on research on the impact of noise on bat roosts[130]

- 150m for **disturbance** to breeding otter holts (NRA, 2006)[131]. These moderate, temporary effects are not likely to result in significant effects as the Moneypoint site is industrial and most fauna using the area are likely habituated to the noise levels on-site.
- According to EPA mapping, a watercourse is shown running through the ASA in the north west corner of the proposed development. However, since the development of the area in the 1980's when the land was developed this local watercourse no longer takes an overland path through this area. Instead it is culverted through the ASA to a collection chamber which collects other surface water arriving at the external boundary of the ASA before discharging to the estuary. A natural pre-existing pond located to the east of the ASA and upstream of the culvert inlet serves to attenuate flow rates and settle out solids before entering the culvert and entering the estuary. The levels in the area of the culvert inlet and pond are significantly lower than the ash storage area (minimum level 14 mOD) by approximately 9 m. There are also a series of formal drains to carry surface water away during rain events etc. The ZoI for surface **water discharge** is, therefore, within the tidal limit of the Shannon Estuary. The development is located entirely in River Shannon catchment and works are hydrologically connected to the River Shannon estuary.

10.3.3.2 Ecological Value

The *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) were adopted as part of this methodology for the purpose of evaluating the importance of ecological features within the survey area. The site evaluation criteria from this assessment methodology are reproduced in Table 10.2.

In accordance with NRA guidelines (2009) and CIEEM (2018), impact assessment is only undertaken for Key Ecological Receptor/s (KER/s). These are features within the ZoI of the proposed development that are "both of sufficient value to be material in decision making and likely to be affected significantly". According to NRA guidelines (NRA, 2009), KERs are those classed as of 'local importance (higher value)' (see Table 10.2) or higher, as per NRA value criteria. Features classed as of 'local importance (lower value)' are not considered to be KERs and are therefore excluded from impact assessment.

[129] UK Bat Mitigation Guidelines A guide to impact assessment mitigation and compensation for developments affecting bats (2023) CIEEM, Version 1.1. Case study 38.

[130] Reason, P.F. and Wray, S. (2023) and a summary of papers from Section 4.3.5-4.3.8, as well as an interpretation of Section of case study 38, it states that "It is possible audible non-natural, unfamiliar or unpredictable noise exceeding 50 dB LZmax could begin to have deleterious effects (e.g. increased stress) on roosting bats. However, this does not mean that disturbance should be considered significant as soon as construction noise exceeds that level".

[131] National Roads Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.

Table 10.2: Site Evaluation Criteria (NRA, 2009)

Ecological Value	Description
Internationally Important	● Sites designated (or qualifying for designation) as a SAC or SPA under the EU Habitats or Birds Directives ● Undesignated sites that fulfil criteria for designation as a European Site ● Features essential to maintaining the coherence of the Natura 2000 network ● Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive ● Resident or regularly occurring populations of birds listed in Annex I of the Birds Directive and species listed in Annex II and/or Annex IV of the Habitats Directive ● Ramsar Sites ● World Heritage Sites ● Biosphere Reserves ● Sites hosting significant species populations under the Bonn Convention ● Sites hosting significant populations under the Berne Convention ● Biogenetic Reserves ● European Diploma Sites ● Salmonid waters
Nationally Important	● Sites or waters designated or proposed as a NHA ● Statutory Nature Reserves ● Refuge for fauna and flora protected under the Wildlife Acts ● National Parks ● Undesignated sites fulfilling criteria for designation as a NHA; Statutory Nature Reserves; Refuge for Fauna and Flora protected under the Wildlife Act and/or a National Park; ● Resident or regularly occurring populations (assessed to be important at the national level) of species protected under the Wildlife Acts and/or species listed on the relevant Red Data list) ● Sites containing viable areas of the habitat types listed in Annex I of the Habitats Directive
County Importance	● Areas of Special Amenity ● Areas subject to a Tree Preservation Order ● Areas of High Amenity, or equivalent, designated under the County Development Plan ● Resident or regularly occurring populations (assessed to be important at the County level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed on the relevant Red Data list ● Site containing area(s) of the habitat types listed in Annex I of the Habitats Directive that do not fulfil criteria for valuation as of International or National Importance

Ecological Value	Description
	● County important populations of species, or viable area of semi-natural habitats or natural heritage features identified in the National or local Biodiversity Action Plan ● Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county ● Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level
Local Importance (higher value)	● Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan ● Resident or regularly occurring populations (assessed to be important at the Local level) of species of birds listed in Annex I of the Birds Directive, species listed in Annex II and/or IV of the Habitats Directive, species protected under the Wildlife Acts and/or species listed in the relevant Red Data list ● Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality ● Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Local Importance (lower value)	● Sites containing small areas of semi-natural habitat that are of some local importance for wildlife ● Sites of features containing non-native species that are of some importance in maintaining habitat links

Source: NRA, 2009

10.3.3.3 Assessment of Impact

Impacts were assessed and characterised in accordance with the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' EPA (2022) as set out in Chapter 5 of this EIAR.

10.3.4 Consultations

Pre-application consultations were carried out with the prescribed bodies and authorities, pertinent to the ecological and biological aspects of this project. Details on all consultation is summarised in Chapter 1 of this EIAR, Table 1.2.

10.3.5 Limitations of this EIAR

All species and habitats within the various ZoI for the proposed development were either appropriately surveyed, with no reported access constraints or limitations, or data was accessed for this from existing resources. It was not possible, for example, to undertake comprehensive surveys for the full 120km ZoI given for marine species and habitats covered by SACs and SPAs.

10.4 Receiving Environment

A detailed description of the Moneypoint Generating Station and wider study area are set out in Chapter 4 of this EIAR.

10.4.1 Designated Sites

Designated sites within the ZoI of the proposed development are detailed below.

10.4.1.1 Sites of International Importance

European Sites

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of high biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. These are collectively referred to as "European sites".

The Moneypoint Generation Station is not located within, but is directly adjacent to, the Lower River Shannon SAC 002165 (NPWS, 2012) and River Shannon and River Fergus Estuaries SPA 004077 (NPWS, 2012)[132].

European sites identified in this assessment as potentially within the various ZoIs of the proposed development (and their qualifying interests/special conservation) are listed in Table G.1 in Appendix G of this EIAR.

[132] NPWS (2012) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

RAMSAR Sites

Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention. The Ramsar Convention is an intergovernmental environmental treaty established in 1971 by UNESCO and that came into force in 1975.

No Ramsar sites were identified within the footprint of the proposed development. Tralee Bay (Ramsar ID: 440) occurs within the ZoI of the proposed development. This site is coincident with the Tralee Bay Complex SPA and Magharee Islands SPA and so is assessed under the European Sites heading. This site is located ca. 44.9km from the proposed development.

10.4.1.2 Sites of National Importance

Natural Heritage Areas within the various ZoIs

Natural Heritage Areas (NHA) are the basic wildlife designation in Ireland. These areas are considered nationally important either for the habitats present or for the species of plants and animals, often whose habitats need protection, they hold. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation (source: www.npws.ie).

No NHAs occur within or immediately adjacent to the proposed development site. One, Illaunonearaun NHA (001014) does occur within (20km) the ZoI for oil spill but as it shares the same features as the SPA of the same name, it is assessed under that designation. No other NHAs occur within any of the relevant ZoIs for the development.

Proposed Natural Heritage Areas within the various ZoIs

Proposed NHAs (pNHAs) are sites published on a non-statutory basis in 1995 (and again in the 2010s), but that have since not been statutorily proposed or designated. These sites are of significance for wildlife and habitats. Prior to statutory designation, pNHAs are still subject to limited protection, in the form of:

- Agri-environmental farm planning schemes support the objective of maintaining and enhancing the conservation status of pNHAs;
- There is a requirement for the Forest Service to gain NPWS approval before they will pay afforestation grants on pNHA lands; and,
- A recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

No pNHAs were recorded within the immediate footprint of the proposed development, although several pNHAs were identified within the ZoI for ‘oil spill’, all but one of the identified pNHAs are coincident with one or more European designated sites and have shared reasoning for their designation. As such, the potential for effects to these specific pNHAs is considered under the relevant European designated site(s) at the impact stage, they are not covered again here. The pNHAs directly coincident with European Sites are:

- Ballylongford Bay pNHA (01332);
- Tarbert Bay pNHA (001386);
- Scattery Island pNHA (001911);
- Clonderalaw Bay pNHA (000027);
- Poulnasherry Bay pNHA (000065);
- Tullaher Lough and Bog pNHA (000070);
- Beal point pNHA (001335);
- Farrihy Lough pNHA (000200);
- Carrowmore Point to Spanish Point and Islands pNHA (001021);

- Inner Shannon Estuary - Shouth Shore pNHA (000435);
- Sturamus Island pNHA (001436); Fergus Estuary and Inner Shannon, North Shore pNHA (002048);
- Loop Head pNHA (000045)
- Akeragh, Banna and Barrow Harbour pNHA (000332);
- Illaunnabarnagh Island pNHA (001359);
- Mucklaghmore Island pNHA (001962);
- Tralee Bay and Magharees Peninsula, West to Cloghane pNHA (002070);
- Illauntannig (Magharees) pNHA (001964);
- Inishtooskert and Illaunimmil pNHA (Magharees) (001965);
- Gurrig Island (Magharees) pNHA (001963);
- Mount Brandon pNHA (000375);
- Sybil Point/Carrigbrean pNHA (001379);
- Slea head pNHA (001377);
- Little Skellig pNHA (001953), and;
- Great Skellig pNHA (001954)

One pNHA, Farrihy Lough pNHA (000200), situated 15.5km from Moneypoint and within the ZoI for oil spill is not coincident with a European Site.

The site synopsis states "*Due to the brackish nature of this lake complete freezing over is prevented during the winter months. This feature is of great importance to large numbers of waders and duck who flock to Farrihy Lough during these harsh weather conditions". Notable species include golden Plover and lapwing with Whooper Swans also known to use this site. There is a "good range of habitats supporting a variety of floral species. The influence of the sea is reflected in the vegetation with many maritime species recorded from the area which include Thrift (Armeria maritima), Bucks horn plantain (Plantago coronopus) and Scurvy grass (Cochleria officinalis)*".

10.4.2 Other Designated Sites

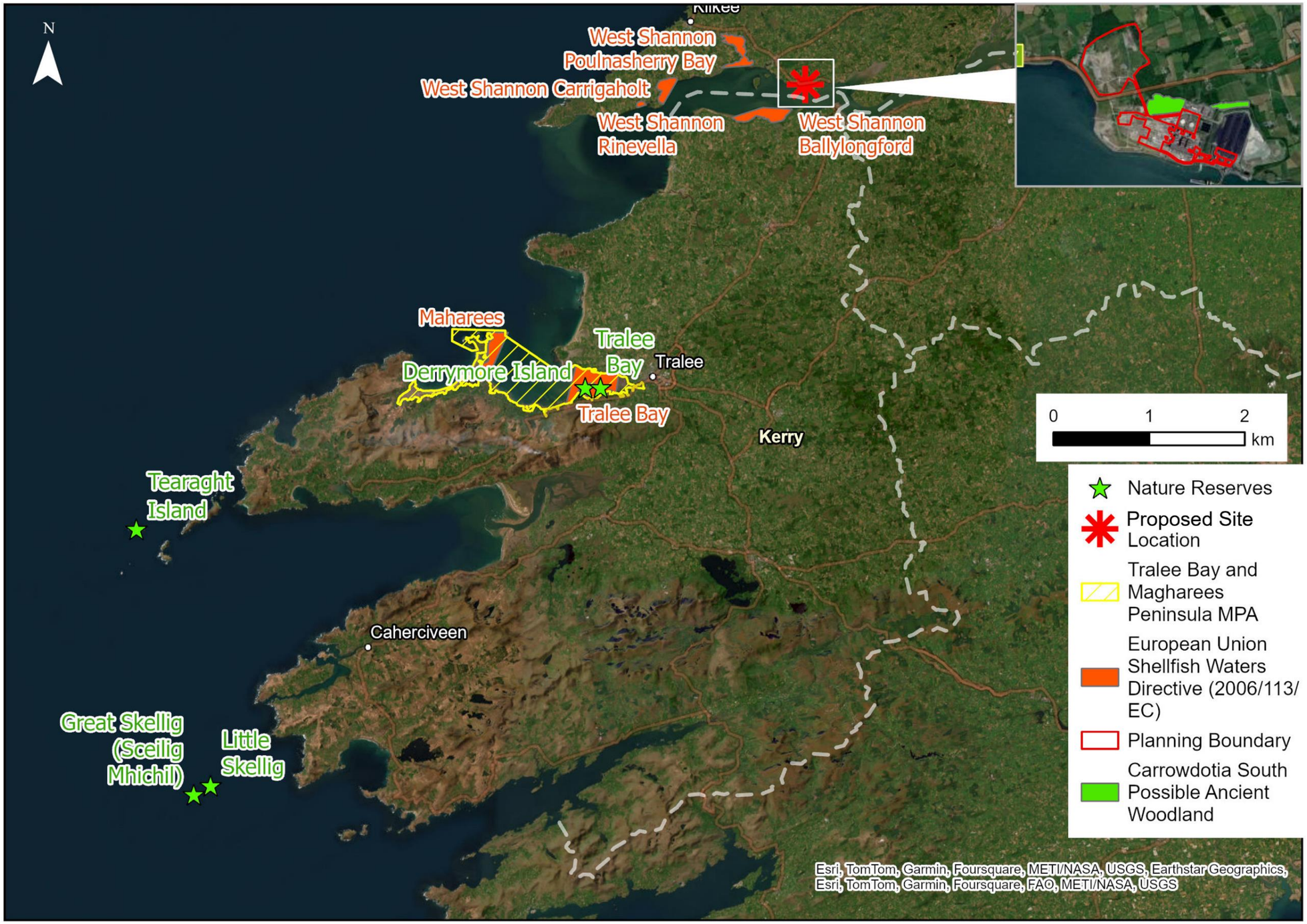
No national parks occur within the ZoI of, or have connectivity to, the proposed development. The Burren National Park is the most proximal, located ca. 49km west of the proposed scheme.

Other sites of nature conservation and of relevance to the proposed development are discussed hereunder.

- The following sites, designated under the European Union Shellfish Waters Directive(2006/113/EC) and protected to safeguard shellfish from harmful effects of discharges or pollutants, are within the ZoI for potential oil spill:
  - West Shannon Ballylongford (EU_PA_Code: IEPA2_0061) (located ca. 3.1km south west of the proposed development)
  - West Shannon Poulnasherry Bay (EU_PA_Code: IEPA2_021) (located ca. 6.3km northwest of the proposed development)
  - West Shannon Carrigaholt (EU_PA_Code: IEPA2_0022) (located ca. 15.6km west of the proposed development)
  - West Shannon Rinevella (EU_PA_Code: IEPA2_0023) (located ca. 20km west of the proposed development)
  - Tralee Bay (EU_PA_Code: IEPA2_0020) (located ca. 47.5km southwest of the proposed development)

  - Inner Bay, Maharees (EU_PA_Code: IEPA2_0009) (located ca. 49.4km southwest of the proposed development).
- Carrowdotia South Possible Ancient Woodland (ALEW_ID: 1520) occurs immediately north of the redline boundary for proposed development. This site is within the ZoI for the proposed development for dust, noise and breeding bats and badger.
- The nearest OSPAR site is the Tralee Bay and Magharees Peninsula, West to Cloghane MPA (O-IE-0002978) (ca. 43.3km southwest), which is within the ZoI for oil spills.
- The following nature reserves are within the ZoI for impacts associated with oil spills:
  - Tralee Bay Nature Reserve occurs ca. 44.7km southwest of the proposed development.
  - Derrymore Bay Nature Reserve (46.7km southwest)
  - Tearaght Island Nature Reserve (102.6km southwest)
  - Little Skellig Nature reserve (117.7km southwest)
  - Great Skellig Nature reserve (119.8km southwest)
- Of the sites listed above, the Shellfish waters are encompassed, and thus covered through assessment of impacts on, the Lower River Shannon SAC, River Shannon and River Fergus Estuaries SPA, Tralee Bay Complex SPA and Tralee Bay and Magharees Peninsula, West to Cloghane SAC. The Tralee Bay and Magharees Peninsula, West to Cloghane MPA and Tralee Bay Nature Reserve are also covered by assessments of Tralee Bay Complex SPA and Tralee Bay and Magharees Peninsula, West to Cloghane SAC.

Figure 10.1: Other Designated sites (as referred to in Section 10.4.2)



Source: Mott MacDonald, 2024

10.4.3 Records of Protected Species and Habitats

10.4.3.1 National Biodiversity Data Centre (NBDC)

The proposed development is located within the 10km grid square of R05. NBDC data for fauna and flora within this grid square was downloaded on 10/10/2023.

Protected Mammals

NBDC records of fauna recorded are outlined below in Table 10.3.

Table 10.3: Protected Terrestrial Mammal Species Recorded within the 10km grid square of R05

Species Name	Conservation Status[133]	Designation
European Otter (*Lutra lutra*)	Least concern	EU Habitats Directive: Annex II, Annex IV and Wildlife Acts
Bottle-nosed Dolphin (*Tursiops truncatus*)	Not evaluated	EU Habitats Directive: Annex II, Annex IV and Wildlife Acts
Common Porpoise (*Phocoena phocoena*)	Not evaluated	EU Habitats Directive: Annex II, Annex IV, Wildlife Acts and OSPAR Convention
Grey Seal (*Halichoerus grypus*)	Least concern	EU Habitats Directive: Annex II, Annex V and Wildlife Acts
Brown Long-eared Bat (*Plecotus auritus*)	Least concern	EU Habitats Directive: Annex IV and Wildlife Acts
Daubenton's Bat (*Myotis daubentonii*)	Least concern	EU Habitats Directive: Annex IV and Wildlife Acts
Lesser Noctule (*Nyctalus leisleri*)	Least concern	EU Habitats Directive: Annex IV and Wildlife Acts
Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	Least concern	EU Habitats Directive: Annex IV and Wildlife Acts
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	Least concern	EU Habitats Directive: Annex IV and Wildlife Acts
Common Dolphin (*Delphinus delphis*)	Not evaluated	EU Habitats Directive: Annex IV and Wildlife Acts
Common Frog (*Rana temporaria*)	Least concern	EU Habitats Directive: Annex V and Wildlife Acts
Pine Marten (*Martes martes*)	Least concern	EU Habitats Directive: Annex V and Wildlife Acts
Eurasian Badger (*Meles meles*)	Least concern	Wildlife Acts
West European Hedgehog (*Erinaceus europaeus*)	Least concern	Wildlife Acts
Irish Hare (*Lepus timidus subsp. hibernicus*)	Least concern	Wildlife Acts
Irish Stoat (M*ustela erminea subsp. hibernica*)	Least concern	Wildlife Acts
Fallow Deer (*Dama dama*)	Least concern	Wildlife Acts

Protected Birds

All birds, their nests and eggs are protected by Irish legislation. Given this, records of species listed in Annex I of the Birds Directive and within the 10km grid square were examined with a view to being:

[133] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National

- in danger of extinction.
- vulnerable to changes in their habitat.
- considered rare due to small populations or a restricted local distribution.
- in need of particular attention due to the nature of the habitat they rely on.

Annex I Bird species recorded within the 10km grid square surrounding the proposed development are provided below in Table 10.4.

Table 10.4: Bird Species protected under Annex I and/ or listed as Red or Amber under the Birds of Conservation Concern in Ireland recorded within the 10km grid square of R05

Species Name	Designation status	BoCCI status[134]
Peregrine Falcon (*Falco peregrinus*)	EU Birds Directive Annex I Bird Species & Wildlife Acts	Green
Little Egret (*Egretta garzetta*)	EU Birds Directive Annex I Bird Species & Wildlife Acts	Green
European Golden Plover (*Pluvialis apricaria*)	EU Birds Directive Annex I Bird Species, Annex II, Section II Bird Species and Annex III, Section III Bird Species & Wildlife Acts	Red
Bar-tailed Godwit (*Limosa lapponica*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Common Tern (*Sterna hirundo*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Sandwich Tern (*Sterna sandvicensis*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Mediterranean Gull (*Larus melanocephalus*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Merlin (*Falco columbarius*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Common Kingfisher (*Alcedo atthis*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Dunlin (*Calidris alpina*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Red
Hen Harrier (*Circus cyaneus*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Red-throated Diver (*Gavia stellata*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Whooper Swan (*Cygnus cygnus*)	EU Birds Directive Annex I Bird Species and Wildlife Acts	Amber
Mallard (*Anas platyrhynchos*)	EU Birds Directive Annex II, Section I Bird Species and Annex III, Section I Bird Species & Wildlife Acts	Amber
Northern Pintail (*Anas acuta*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section II Bird Species & Wildlife Acts	Amber
Eurasian Wigeon (*Anas penelope*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section II Bird Species & Wildlife Acts	Amber
Tufted Duck (*Aythya fuligula*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section II Bird Species & Wildlife Acts	Amber

[134] Gilbert G., Stanbury A and Lewis L (2021), Birds of Conservation Concern in Ireland 2020-2026. Irish Birds 9: 523-544

Species Name	Designation status	BoCCI status[134]
Eurasian Teal (*Anas crecca*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section II Bird Species & Wildlife Acts	Amber
Red-breasted Merganser (*Mergus serrator*)	EU Birds Directive Annex II, Section II Bird Species & Wildlife Acts	Amber
Mute Swan (*Cygnus olor*)	Wildlife Acts	Amber
Lesser Black-backed Gull (*Larus fuscus*)	Wildlife Acts	Amber
Northern Gannet (*Morus bassanus*)	Wildlife Acts	Amber
Black-legged Kittiwake (*Rissa tridactyla*)	Wildlife Acts	Amber
Common Guillemot (Uria aalge)	Wildlife Acts	Amber
Barn Swallow (*Hirundo rustica*)	Wildlife Acts	Amber
Common Kestrel (*Falco tinnunculus*)	Wildlife Acts	Amber
Common Linnet (*Carduelis cannabina*)	Wildlife Acts	Amber
Common Shelduck (*Tadorna tadorna*)	Wildlife Acts	Amber
Common Starling (*Sturnus vulgaris*)	Wildlife Acts	Amber
European Shag (*Phalacrocorax aristotelis*)	Wildlife Acts	Amber
Great Crested Grebe (*Podiceps cristatus*)	Wildlife Acts	Amber
House Martin (*Delichon urbicum*)	Wildlife Acts	Amber
House Sparrow (*Passer domesticus*)	Wildlife Acts	Amber
Mew Gull (*Larus canus*)	Wildlife Acts	Amber
Ringed Plover (*Charadrius hiaticula*)	Wildlife Acts	Amber
Sand Martin (*Riparia riparia*)	Wildlife Acts	Amber
Sky Lark (*Alauda arvensis*)	Wildlife Acts	Amber
Spotted Flycatcher (*Muscicapa striata*)	Wildlife Acts	Amber
Great Cormorant (*Phalacrocorax carbo*)	Wildlife Acts	Amber
Herring Gull (*Larus argentatus*)	Wildlife Acts	Amber
Black-headed Gull (*Larus ridibundus*)	Wildlife Acts	Amber
European Greenfinch (*Carduelis chloris*)	Wildlife Acts	Amber
Goldcrest (*Regulus regulus*)	Wildlife Acts	Amber
Grey Wagtail (*Motacilla cinerea*)	Wildlife Acts	Amber
Redwing (*Turdus iliacus*)	Wildlife Acts	Amber
Ruddy Turnstone (*Arenaria interpres*)	Wildlife Acts	Amber
Willow Warbler (*Phylloscopus trochilus*)	Wildlife Acts	Amber
Common Snipe (*Gallinago gallinago*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section III Bird Species & Wildlife Acts	Red

Species Name	Designation status	BoCCI status[134]
Eurasian Woodcock (*Scolopax rusticola*)	EU Birds Directive Annex II, Section I Bird Species, Annex III, Section III Bird Species & Wildlife Acts	Red
Greater Scaup (*Aythya marila*)	EU Birds Directive Annex II, Section II Bird Species, Annex III, Section III Bird Species & Wildlife Acts	Red
Northern Lapwing (*Vanellus vanellus*)	EU Birds Directive Annex II, Section II Bird Species & Wildlife Acts	Red
Eurasian Curlew (*Numenius arquata*)	EU Birds Directive Annex II, Section II Bird Species & Wildlife Acts	Red
Common Swift (*Apus apus*)	Wildlife Acts	Red
Black-tailed Godwit (*Limosa limosa*)	Wildlife Acts	Red
Eurasian Oystercatcher (*Haematopus ostralegus*)	Wildlife Acts	Red
Barn Owl (*Tyto alba*)	Wildlife Acts	Red
Common Redshank (*Tringa totanus*)	Wildlife Acts	Red
Meadow Pipit (*Anthus pratensis*)	Wildlife Acts	Red

Protected Flora

NBDC records of flora recorded within the 10km grid square were also assessed. No records of threatened, rare or endangered species, or species of high conservation value in terms of flowering plant species, within the last 10 years, were found. No species protected under Flora (Protection) Order 2022[135] were recorded. No mosses or liverworts have been recorded within the grid square.

Invasive Species

The National Biodiversity Data Centre also contains records for invasive species listed under Part 1 of the Third Schedule of S.I. No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations 2011, as amended. These records are provided below in Table 10.5Table 10.5.

Table 10.5: Invasive Species Records recorded within the 10km grid square of R05

Species Name	Impact
Japanese Knotweed (*Fallopia japonica*)	High Impact Invasive Species
Rhododendron Rhododendron ponticum	High Impact Invasive Species
Fallow Deer (*Dama dama*)	High Impact Invasive Species

10.4.4 Other Notable Species known to occur off the West Coast of Ireland

During the summer months, sunfish (*Mola mola*), listed as Vulnerable status by IUCN Red List, migrate into Irish coastal waters. The northern coastline of the Dingle peninsula (from Smerwick Harbour to Brandon Head) is one such area where they are regularly seen (Irish Examiner, Friday, 14th January, 2022[136]).

Atlantic Leatherback turtles (*Dermochelys coriacea*), also listed as Vulnerable status by IUCN Red List, have also been reported, along with marine other mammals, and as they predate the same kind of jellyfish as *Mola mola* may well occur in the same range.

[135] S.I. No. 235 of 2022 Flora (Protection) Order 2022

[136] https://www.irishexaminer.com/news/munster/arid-40784466.html accessed 18/01/2024

10.4.5 Previous Ecological Surveys within the ZoI of the Proposed Development

10.4.5.1 Bat Assessment

A bat assessment was carried out in and around Moneypoint and surrounding woodland in 2021.

Seven species of bat were recorded, namely: Lesser horseshoe bat (*Rhinolophus hipposideros*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), brown long-eared bat (*Plecotus auratus*) and Natterer's bat (*Myotis nattereri*). Additional Myotis species echolocation calls were also recorded, but not identified to species level. Four of the species were recorded roosting outside the proposed development boundary, in a woodland north of the Moneypoint Generation Station, namely: lesser horseshoe bat, soprano pipistrelle, brown long-eared bat and Natterer's bat.

The number of bats recorded for lesser horseshoe bats were indicative of a summer roost and, therefore, likely to be a maternity roost. This is an important find as there are few other known lesser horseshoe records in the 10km radius of the area. In addition, the documentation of the lesser horseshoe bat usage of the woodland, located adjacent to the roost and within the survey area, also determines that this habitat is a foraging ground for this, and all of the other bat species recorded.

Foraging and commuting behaviours were recorded for all bat species noted and the adjacent woodland and surrounding scrub habitats in vicinity of the roost provide this essential habitat for local bat populations. Additional woodland and treelines north of the survey site, that are connected to those habitats within the survey area, were also noted by the bat Ecologist who completed the assessment. It was also determined that the woodland and scrub habitat within the survey area are the primary location of suitable bat habitat within a 2.5km radius of known roost, the distance within which lesser horseshoe bats forage.

The survey site is used extensively as a roosting, foraging and commuting habitat for local bat populations. The number of bat species, and the level of bat activity, recorded indicates that the survey area is an important area for local bat populations, particularly lesser horseshoe bats.

10.4.5.2 Marine Mammal and Seabird Surveys

Baseline survey work commenced others on behalf of ESB in 2021 and is ongoing as part of a separate project currently under development..

To date, cetaceans (including bottlenose dolphin (*Tursiops truncatus*), Common dolphin (*Delphinus delphis*) and Harbour Porpoise (*Phocoena phocoena*) were recorded. Cetacean records were twice as common along the outer estuary than the inner estuary (seven), with no sightings recorded within the inner estuary on six occasions. Sightings varied in the number of individuals and number of groups recorded, with these ranging from one to 20 individuals and one to six groups.

The presence of seal species were recorded in the inner and outer estuary

Using static acoustic monitoring and to date, dolphins were recorded on 90% of days at Moneypoint and 85% of days at Tarbert. Confirming what has already been shown in studies carried out by the IWDG group, i.e., that bottlenose dolphins use Moneypoint for longer periods during winter months.

Boat-based surveys of seabirds have to date recorded a total of at least 25 species, with herring gull and guillemot in every survey. A total of 2,608 birds have been counted, with razorbill, guillemot, black-headed gull and herring gull being the most abundant species, followed by

great black-backed gull, Manx shearwaters and black guillemot. A single sighting of 150 golden plover near Hog Island contributed to the abundant presence of this species when compared to the other species observed.

10.4.5.3 Marine Habitat Survey

A dropdown video survey was carried out for the redevelopment of Moneypoint Generating Station. These surveys showed that the dominant subtidal habitat in the area surrounding Moneypoint is a subtidal reef community corresponding to the NPWS “Anemone-dominated subtidal reef community”, corresponding with EU Habitats Directive Annex I habitat Reefs (1170) and often found in conjunction with Estuaries (1130). Reef habitat was also noted in the channel to the south of Moneypoint Generating Station, which is not in keeping with NPWS mapping[137]. The area is most characteristic of the Marine Nature Conservation Review biotype ‘*Urticina felina* and sand-tolerant fauna on sand-scoured or covered circa-littoral rock’. It is noted that this biotype is only occasionally recorded as a separate entity as it is typically restricted to a narrow band of rock at the sediment interface. The scouring effect of the River Shannon on the central channel provides for the establishment of this community over a wider area.

10.4.5.4 Ecological Site Walkover of the Moneypoint Site

A site walkover was conducted on August 2021, within the wider study area within the Moneypoint Generating Station complex, as part of the ecological assessment for another project.

In summary, the existing substation at Moneypoint is comprised of hard standing surfaces and gravelled areas with a palisade fence (BL3). Directly adjacent to the palisade fence a steeply sloped bank has been cut. This has begun to revegetate with willow scrub now encroaching on the fence. The land to the north of the substation slopes down towards the hardstanding. The habitats surrounding the substation included a mixture of rank wet grassland (GS4), scrub (WS1), broadleaf woodland (WD1), and coniferous woodland (WD4). Drainage ditches (FW4) were present throughout the site. Of note is a derelict house located on the edge of the eastern border of the survey area.

Signs of badgers were recorded within the mature broadleaf woodland and within the habitats to the north of the existing substation. No setts were recorded during the site walkover.

Four trees were recorded with a high potential for supporting bat roosts within the study area. The open nature of the woodland, given the lack of understory, is such that it may form foraging habitat for bats.

In addition to some trees having high potential to support bat roosts, a lesser horseshoe bat roost was also recorded in the area. This roost site was surveyed in 2019.

10.4.5.5 Habitat Survey and Report

Baseline ecology surveys were undertaken in 2022 and 2023 as part of a separate project currently under development. These surveys overlapped with areas of the proposed development and a summary of the relevant results is presented below.

Flora

During the desk study, no records of any rare or protected flora were noted within the study area over the past 25 years. Similarly, no instances of rare or protected flora were found within the study area during the surveys carried out in 2023.

[137] As stated in Section 10.4.4.1, however, this data is interpolated from a range of data sources and is not based on targeted habitat assessments.

Invasive species

The desk study revealed no records of Third schedule Invasive species within the study area. 2023 site surveys recorded sea-buckthorn (*Hippophae rhamnoides*), a third Schedule invasive species. Sea-buckthorn bushes were found behind buildings and within scrub on the eastern side of the study area, however these are located outside the redline boundary of the Proposed development.

Habitats

The habitat surveys were carried out in June and August 2023. A number of habitats, broadly fitting into the categories of Grassland, Woodland, Hedgerows, Treelines and Scrub, Disturbed and man-made ground and Aquatic/Coastal habitats, were recorded.

Of note was an area classified as possible ancient woodland by the NPWS (Perrin et al. 2008). The habitat is located immediately north of the redline boundary of the proposed development.

Fauna

Bats

Field surveys involved a number of surveys and assessments. Bat activity transect surveys found three species of bat (soprano pipistrelle, common pipistrelle and Leisler's bat) commuting and/or foraging within the study area. Static bat detectors also detected calls of the brown long-eared bat, unidentified Myotis bat, unidentified Pipistrelle bat and Annex II Lesser horseshoe bat.

A survey of potential bat roosts within and surrounding the study area south of the N67 was conducted 21st August 2023. A total of 66 features were investigated, of which 44 were considered to have negligible overall suitability as a bat roost. Twenty-one features were found to have low suitability as bat roosts based on ongoing disturbance due to noise, light or activity, however, many show signs of bat activity (e.g., low numbers of discarded insect remains). Only one structure was considered to have moderate suitability, this consisted of an unused building (Feature code: BS4) with no signs of human disturbance. Significant numbers of insect wings, bat droppings, roosting features and sufficient access was noted within this structure.

Figure 10.2: Location of an area classified as ancient woodland by the NPWS (Perrin et al. 2008)

Source: Extracted from National Survey of Native Woodlands 2033-2008 (NPWS, Perrin et al. 2008)

Bat emergence and re-entry surveys for two of the above-mentioned derelict structures and four actively used buildings were carried out. Only the unused building considered to have moderate suitability (feature code: BS4) recorded emergence and re-entry behaviour associated with it.

Lesser Horseshoe bat calls were recorded in proximity to structure BS4 during the emergence survey, however no visual confirmation of the bat was noted on the camera facing the structure. A further specific roost inspection was undertaken, under licence from the NPWS, to assess the presence of Lesser Horseshoe bats within this structure. No Lesser horseshoe bats were encountered during visit but access to a loft area was restricted. Some calls were recorded. Bat recorders were deployed for a two-week period and samples of bat droppings were also taken for eDNA analysis to confirm the species of bat present, however, the results of this analysis had not been returned at the time of release of this report [10/11/2023]. The deployment of further static recorders within the building and planned hibernation surveys are required to confirm Lesser horseshoe bat within this structure. This structure is not located within the Redline boundary of the proposed development, however, is immediately adjacent to it.

Protected Mammals

Otter

Signs of otter were searched for during walkover surveys undertaken in 2022 and during a dedicated otter survey in 2023. Multiple signs of otter including spraints and couches were identified during these surveys.

Two of three couches identified during an otter survey in 2022 were re-found. No otter holts were confirmed at the site, however, possible holting sites were identified at two locations. One was identified within the armour under the bridge to the jetty and the second was located under the pier towards the east of the site. It was not possible to thoroughly search these areas, but multiple, large accumulations of spraints at these locations were noted. Furthermore, there is ample holting opportunity within gaps etc. within the well sheltered rock armour under the bridge.

These features are located outside of, but in close proximity to, the redline boundary of the proposed development.

Badger

Site surveys undertaken in July and August 2023 found multiple badger signs within the study area. These signs of badger included setts, scat, hair, trails, prints, snuffle holes, and potential signs of badger (mammal trails). Only one sign of badger occurred within the redline boundary of the proposed development, with all remaining features located within the woodland to the immediate north of the redline boundary.

Other Mammals

A number of mammal holes and tunnels varying in size were found in the mixed broadleaved woodland on the north-western perimeter of the study area. Some of these looked in use but the occupants were unknown and given their size, they did not belong to either otter or badger. These are located outside of the redline boundary of the proposed development.

Irish hares were observed repeatedly, with sightings concentrated around the south-western area of the study area, this is located outside of, but in close proximity to, the redline boundary of the proposed development.

Reptiles and Amphibians

No records or evidence of any reptile or amphibian species were identified during field survey in 2023. Suitable habitat for reptiles and amphibians were recorded within the site.

Invertebrates

No records or incidental evidence of any rare or protected terrestrial invertebrate species was identified during any field surveys in 2023. The report notes a dedicated invertebrate survey is scheduled for 2024.

10.4.5.6 Information from a Bird Survey and Report

Breeding and winter bird surveys were undertaken at Moneypoint in 2022 and 2023, as part of a separate project currently under development. All surveys were undertaken with reference to the relevant guidelines and/or methodologies. A summary of the results is presented below.

Vantage Point Survey 2022 and 2023

Vantage point surveys took place between August 2022 and July 2023 at three vantage point locations, two within the vicinity of the Ash Storage Area (ASA) and a third within the Flue-Gas Desulphurisation (FGD) by product storage area in the east, only VP 2, located near centre of the ASA was within the redline boundary of the proposed development, however given the mobile nature of avifauna, the data collected from all three locations is relevant.

For the purposes of this survey, target species were determined as:

- Qualifying Interests of River Shannon and River Fergus Estuaries SPA and species listed on Annex 1 of the Birds Directive (i.e., primary target species)
- Waterbirds and raptors not listed as Qualifying Interests of River Shannon and River Fergus Estuaries SPA (i.e., secondary target species)

The report states that a total of 1,802 individual birds of 20 target species, were recorded from the VP surveys, including:

Ten primary target species	Ten secondary target species
Black-headed gull *Chroicocephalus ridibundus*	Buzzard *Buteo buteo*
Chough *Pyrrhocorax pyrrhocorax*	Common gull *Larus canus*
Cormorant *Phalacrocorax carbo*	Great black-backed gull *Larus marinus*
Curlew *Numenius arquata*	Grey heron *Ardea cinerea*
Dunlin *Calidris alpina*	Herring gull *Larus argentatus*
Lapwing *Vanellus vanellus*	Kestrel *Falco tinnunculus*
Little egret *Egretta garzetta*	Lesser black-backed gull *Larus fuscus*
Little gull *Hydrocoloeus minutus*	Mallard *Anas platyrhynchos*
Ringed plover *Charadrius hiaticula*	Snipe *Gallinago gallinago*
Peregrine falcon *Falco peregrinus*	Sparrowhawk *Accipiter nisus*

A number of other species including BOCCI listed snipe were also recorded.

Breeding Bird Surveys (BBS) 2022 and 2023

Four visits were made each BBS area during the breeding season in 2022 and 2023. The report states that a total of 37 species were recorded within, or flying over, the proposed Development site, especially in and around the ASA and to the west of the coal yard, during field survey for breeding birds across the 2022 season and a total of 31 species across the 2023 season. 24 species were noted as probable or confirmed breeding in 2022, and 19 in 2023 including seven species of conservation concern, these included:

- Coot *Fulicra atra* – confirmed breeding
- Greenfinch *Chloris chloris* – probable breeding
- Linnet *Linaria cannabina* – confirmed breeding

- Meadow Pipit *Anthus pratensis* – confirmed breeding
- Ringed plover *Charadrius hiaticula* – confirmed breeding
- Swallow *Hirundo rustica* – confirmed breeding
- Wheatear *Oenanthe Oenanthe* – confirmed breeding

In general, these birds occur outside of the redline boundary of the proposed development, with the exception of the ASA which hosts BOCCI Amber listed Swallow, Ringed Plover and Linnet, and Red listed Meadow Pipit. These species are considered to be within the ZoI of the proposed development.

Wintering Bird Surveys (WBS) 2022/2023

Five visits were made to the survey area between early November 2022 and late-February 2023. A total of 18 species were recorded within, or flying over, the proposed development site, especially in and around the ASA and to the west of the coalyard, of which 14 were species of conservation concern, including five Special Conservation Interests of River Shannon and River Fergus Estuaries SPA:

- Black-headed Gull Chroicocephalus ridibundus
- Teal Anas crecca
- Redshank Tringa totanus
- Ringed Plover Charadrius hiaticula
- Lapwing Vanellus vanellus
- Buzzard Buteo buteo
- Common Gull *Larus canus*
- Herring Gull Larus argentatu
- Kestrel Falco tinnunculus
- Kittiwake Rissa tridactyla
- Mallard Anas platyrhynchos
- Snipe Gallinago gallinago
- Sparrowhawk Accipiter nisus
- Woodcock Scolopax rusticola

In general, these birds occur outside of the redline boundary of the proposed development, with the exception of the Ash Storage Area and to the west of the coal yard, both of which host BOCCI Amber listed Mallard, Teal, Black-headed gull and Common Gull, and Red listed Snipe. Additionally protected bird species Buzzard and Sparrowhawk were identified in close proximity of the proposed development. These species are considered to be within the ZoI of the proposed development.

10.4.6 Mott MacDonald Field Survey results

10.4.6.1 Habitat Survey Results

The majority of the proposed development is to occur on built land but will require some works within semi-natural habitats, such as scrub and a number of modified grasslands. Additionally, works will be carried out in the vicinity of woodland and coastal habitats.

Although the footprint of the proposed development does not overlap with any European sites, it is located immediately adjacent to the River Shannon and River Fergus Estuaries SPA (004077) and the Lower River Shannon SAC (002165), respectively.

While historic maps of the proposed development area indicate the presence of a number of streams within the proposed development, following the initial development of this site and associated land reclamation works, these streams have either been culverted (as is the case for the Molougha stream[138]) or diverted and are no longer present within the proposed development.

There is one pond located within the vicinity of the proposed development, occurring within the boundary of the ASA north of the N67 surrounded in semi-natural woodland/scrub mosaics. Although there is an absence of natural water courses, there is, however, a formal drainage network within the proposed development that provides a hydrological connection to the above-mentioned Europeans sties.

Habitat classification codes are provided with reference to level 3 as per Fossit (2000[139]) and Figure 10.3 depicts the location of the habitats referred to in the following sections.

Sea walls, Piers and Jetties (CC1)

Much of the south and southwestern boundary of the proposed development is located immediately adjacent to coastal defence structures consisting of large rocks. This habitat was found to be species poor mainly consisting of bare rock armour with a number of species of disturbed ground such as Bramble (*Rubus fruticosus* agg.), grass species such as Yorkshire fog (*hulcus lanatus*), flowering plant Lesser Hawkbit (*Leontodon saxatilis*) where the coastal defences meet the roadside verge. It is noted that this habitat **does not** occur within the boundary of the proposed development. This habitat **does not conform to Annex I quality habitat**.

This habitat is assessed as being of **Local Importance (Lower Value)**.

Photo 10.1: Coastal Defences immediately South of the Proposed Development

[138] Moneypoint Ash Storage Area Development, ESB Power Generation and Wholesale Markets, Environmental Impact Statement, QS-000132-01-R001, June 2014

[139] Fossitt, J.A. (2000) A guide to habitats in Ireland, The Heritage Council, ISSN 1393 – 68 08, ISBN 1 901137 27 9

Building and Artificial Surfaces (BL3) and Bare Ground (ED2)

A significant area of the proposed development is considered to be built land and artificial surfaces, consisting of internal access roads, buildings including storage sheds, housing for generation equipment and associated industrial infrastructure. Gravelled and hardstanding areas surrounding these features.

Some disused buildings have shown signs of overgrowth and vegetation intrusion, by species such as Ivy (*Hedera helix*), Gorse (*Ulex europaeus*) bramble and Willow spp. (*Salix* spp.). Large sections of bare ground are noted north of the N67 in the ash deposition area. Active ash deposition is ongoing in these areas, where it has ceased in adjacent lands and reverted to semi-natural grassland habitat, discussed below.

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Lower Value)**.

Photo 10.2: Building and surrounding gravelled surface within the Moneypoint Generating Station

Photo 10.3: Bare ground located in the Ash Storage Area, north of the N67

Recolonising Bare Ground (ED3)

Some areas of bare ground/gravelled verges have overgrown and are showing signs of reversion to grasslands, particularly Dry Calcareous and neutral grassland (GS1) (Photo 10.4). Species recorded include Bee orchid (*Ophrys apifera*), Yellow wort (*Blackstonia perfoliata*), Common knapweed (*Centaurea nigra*), Plantain (*Plantago lanceolata*), Birds foot trefoil (*Lotus corniculatus*) and Clover (*Trifolium* spp.).

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Lower Value)**.

Photo 10.4: Recolonised bare ground within Moneypoint Generating Station

Scrub (WS1)

Areas of scrub are noted to occur across the proposed development boundary and consist of typical species such as Gorse, ivy and bramble (Photo 10.5). Other common components include spinose plants such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), and erect or scrambling roses (*Rosa* spp.), in addition to a number of Willows, Birch (*Betula* spp.) and Hazel (*Corylus avellana*).

Medium impact invasive species Japanese Rose (*Rosa Rugosa*) was also identified within an area of scrub habitat north of the N67 (Photo 10.6).

These habitats occur in a number of contexts including in mosaics with other woody habitats.

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Higher Value)**.

Photo 10.5: Scrub located within the Moneypoint Generating Station

Photo 10.6: Scrub habitat including Japanese rose located within the Ash Storage Area, north of the N67

(Mixed) Broadleaf Woodland (WD1)

Areas of WD1 are located along much of the peripheral boundary of the proposed development north of the N67 and outside, but immediately adjacent to, the northern boundary of the southern section of the proposed development.

These woodlands occur in a number of contexts including in established mixed and single species stands and grading into and out of scrub habitats. Species recorded varied from area to area but included Oak (*Querus* spp.), Ash (*Fraxinus excelsior*), Birch spp., Willow spp., pine spp. (*Pinus* spp.), beech (*Fagus* spp.). Semi-natural ground flora was observed in the Oak woodland located to the northwest and western boundaries of the section of the proposed development north of the N67.

In general, these habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Higher Value)**.

An area of potential Ancient Woodland is located to the immediate north of a section of the southern section of the proposed development, with a second section of Potential Ancient Woodland located ca 225m northwest of the proposed development at the most proximal point.

This is assessed as being of **Local Importance (Higher Value).**

Dry Meadows and Grassy Verges (GS2)

This habitat type is common on the proposed site, being one of the grassland types which has developed on overgrown and reverting ash deposits.

This habitat is typified by occasional maintenance (e.g., mowing) with little to no grazing or fertiliser application. This pattern of management produces grasslands with a high proportion of tall, coarse and tussocky grasses such as False Oatgrass (*Arrhenatherum elatius*) and Cock's-foot (*Dactylis glomerata*). Other grasses may include Yorkshire-fog, Smooth Meadow-grass (*Poa pratensis*), and Meadow Foxtail (*Alopecurus pratensis*). Broadleaved herbs such as Cow Parsley (*Anthriscus sylvestris*), Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*), Common Knapweed, Meadow Vetchling (*Lathyrus pratensis*), Pignut (*Conopodium majus*), Creeping Cinquefoil (*Potentilla reptans*) and clovers may also occur.

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Lower Value)**.

Photo 10.7: Dry meadow habitat, located north of the N67

Dry Humid Acid Grassland (GS3)

Two areas of dry humid acid grassland are noted to occur within the western half of section of the proposed development north of the N67.

Dense low swards of narrow-leaved grasses such as bents (*Agrostis capillaris, A. tenuis*), fescues (*Festuca* spp.), Sweet Vernal-grass (*Anthoxanthum odoratum*), and Wavy Hairgrass (*Deschampsia flexuosa*) tend to dominate this habitat. Woodrushes (*Luzula* spp.), Small sedges may also make up a significant proportion of the vegetation with common broadleaved herbs including, Tormentil (Potentilla erecta), White Clover (Trifolium repens), and Common Dog violet (Viola riviniana). Scattered shrubs of Hawthorn or patches of gorse are also common.

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Lower Value)**.

Photo 10.8: Dry Humid Acid Grassland, located south of the N67

Other Artificial Lakes and Ponds (FL8)

There is one pond located within the vicinity of the proposed development, occurring within the boundary of the ASA north of the N67 surrounded in semi-natural woodland/scrub mosaics.

This habitat **does not conform to Annex I quality habitat** and is assessed as being of **Local Importance (Lower Value)**.

Reservoirs (FL7)

A water storage reservoir is also located within the existing Moneypoint Generation Station surrounded by built ground with close connections to the industrial elements on site and a second occurs ca. 43m from the proposed development in the southern section.

This habitat **does not conform to Annex I quality habitat** and is assessed as being of **Local Importance (Lower Value)**.

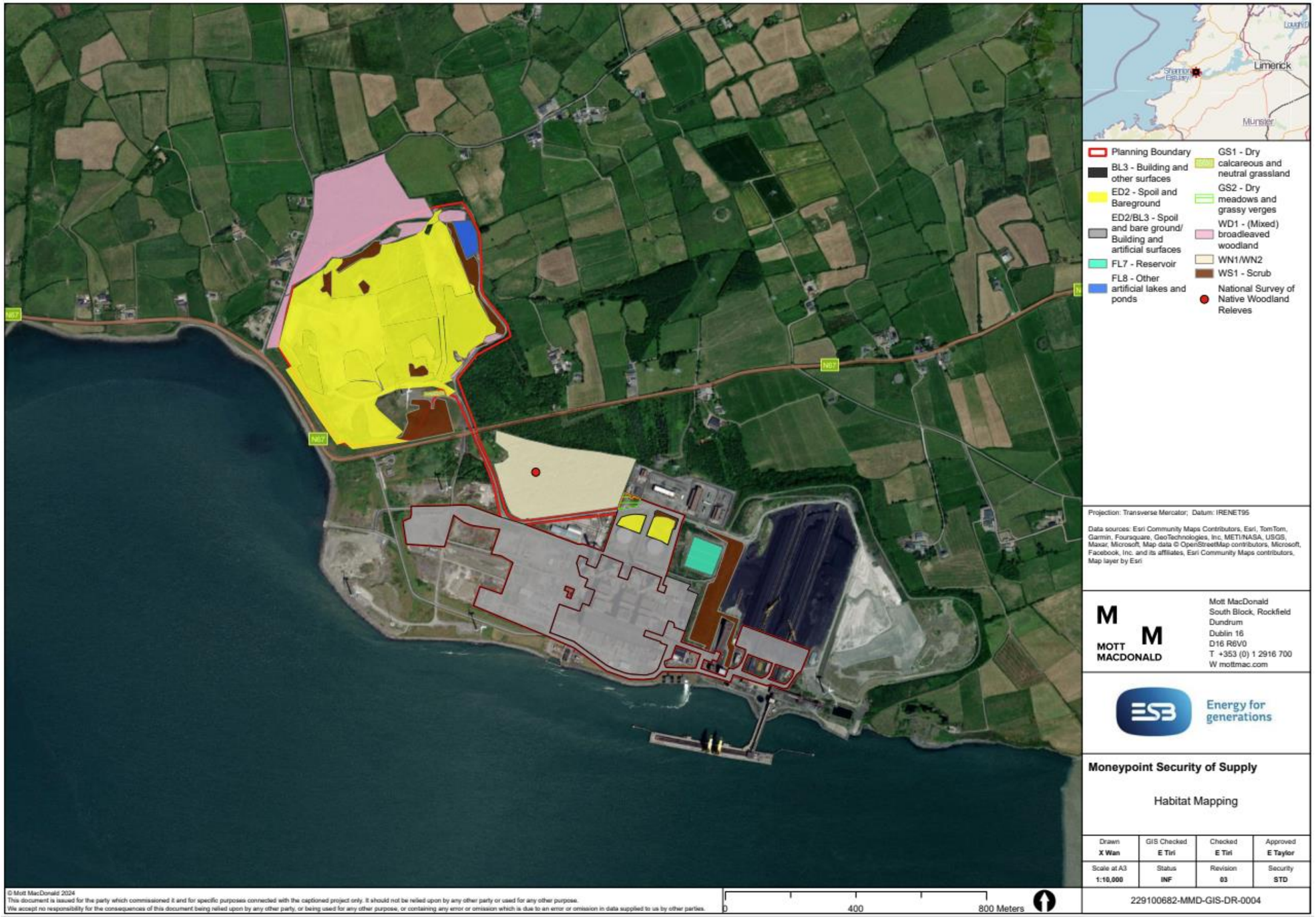
Photo 10.9: One of the water storage reservoirs in located within the Moneypoint Generating Station

Hedgerow (WL1) / Treeline (WL2)

Hedgerow and treeline habitats are noted throughout the proposed development, particularly along the outer boundaries. Species composition of these habitats varied throughout the site and, in general, species recorded within these linear landscape features included Poplar (*Populus* spp.), Hawthorn, Ash, Oak (*Quercus* spp.), Alder (*Alnus glutinosa*), Pine (*Pinus* spp.), Willow, European larch (*Larix decidua*), Rowan (*Sorbus aucuparia*), Sycamore (*Acer pseudoplatanus*), *Olearia traversiorum*, and Ivy.

These habitats **do not conform to Annex I quality habitat** and are assessed as being of **Local Importance (Higher Value)**.

Figure 10.3: Habitat Mapping (after Fossitt, 2000) for the Moneypoint Site



Source: Mott MacDonald, 2024

10.5 Summary of Key Ecological Receptors

The key ecological receptors within the various ZoIs of the proposed development are evaluated in accordance with the evaluation criteria set out in Table 10.2 in Section 10.3.3 of this Chapter. The existing baseline condition / population stability, conservation status, rarity and legal protection of the key ecological receptors was considered as part of this evaluation. A summary of the ecological valuation and identification of Key Ecological Receptors is provided below in Table 10.6.

Table 10.6: Ecological Valuation and Identification of KERs

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
Designated sites / Natura 2000 Sites (also covering directly coincident NHAs and pNHAs)			
SPAs			
River Shannon and River Fergus Estuaries SPA 004077	International importance	Yes - due to proximity and the remote risk to the SCIs of this SPA in the event of a catastrophic oil spill in the estuary	Yes
Mid-Clare Coast SPA 004182		Yes - due to the remote risk to the SCIs of this SPA in the event of a catastrophic oil spill in the estuary	Yes
Illaunonearaun SPA 004114			
Kerry Head SPA 004189			
Loop Head SPA 004119			
Cliffs of Moher SPA 004005			
Tralee Bay Complex SPA 004188			
Magheree Islands SPA 004125			
Dingle Peninsula SPA 004153			
Blasket Island SPA 004008			
Skelligs SPA 004007			
004152 Inishmore SPA			
004159 Slyne Head to Ardmore Point Islands SPA			
004170 Cruagh Island SPA			
004175 Deenish Island and Scariff Island SPA			
004182 Mid-Clare Coast SPA			
004066 The Bull and The Cow Rocks SPA			
004144 High Island, Inishshark and Davillaun SPA			
004003 Puffin Island SPA			

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
004181 Connemara Bog Complex SPA	International Importance	Yes - due to the remote risk to all SCIs except Merlin (*Falco columbarius*) [A098] and Golden Plover (*Pluvialis apricaria*) [A140] of this SPA in the event of a catastrophic oil spill in the estuary	Yes
004155 Beara Peninsula SPA		Yes - due to the remote risk to all SCIs except Chough (*Pyrrhocorax pyrrhocorax*) [A346] of this SPA in the event of a catastrophic oil spill in the estuary	Yes
004029 Castlemaine Harbour SPA		Yes - due to the remote risk to all SCIs except Chough (*Pyrrhocorax pyrrhocorax*) [A346] of this SPA in the event of a catastrophic oil spill in the estuary	Yes
004031 Inner Galway Bay SPA		Yes - due to the remote risk to all SCIs except Golden Plover (*Pluvialis apricaria*) [A140] and Lapwing (Vanellus vanellus) [A142] of this SPA in the event of a catastrophic oil spill in the estuary	Yes
004154 Iveragh Peninsula SPA		Yes - due to the remote risk to all SCIs except Chough (*Pyrrhocorax pyrrhocorax*) [A346] of this SPA in the event of a catastrophic oil spill in the estuary	Yes
004231 Inishbofin, Omey Island and Turbot Island SPA	International Importance	No – the only SCI is Corncrake (*Crex crex*) which breeds and feeds inland	No
SACs			
000328 Slyne Head Islands SAC	International Importance	Yes - due to the remote risk to all QIs of this SAC in the event of a catastrophic oil spill in the estuary	Yes
000335 Ballinskelligs Bay and Inny Estuary SAC			
002261 Magharee Islands SAC			
000036 Inagh River Estuary SAC			
002262 Valencia Harbour/Portmagee Channel SAC			
002263 Kerry Head Shoal SAC			
002264 Kilkee Reefs SAC			
002265 Kingstown Bay SAC			
002998 West Connacht Coast SAC			
Lower River Shannon SAC 002165	International Importance	Yes – for all QIs other than: Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]; *Molinia* meadows on calcareous, peaty or clayey-silt-	Yes

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
		laden soils (*Molinion caeruleae*) [6410]; Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-*Padion*, *Alnion incanae*, *Salicion albae*) [91E0], and; *Lampetra planeri* (Brook Lamprey) [1096] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary. There is also a theoretical pathway to impact the QI *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]; through the QI *Salmo salar* (Salmon) [1106] in such an event	
000020 Black Head Poulsallagh Complex SAC		Yes, for the QIs: Reefs [1170]; Perennial vegetation of stony banks [1220]; Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130], and; Submerged or partially submerged sea caves [8330] due to the remote risk to the SAC in the event of a catastrophic oil spill in the estuary	Yes
000090 Glengarriff Harbour and Woodland SAC		Yes, for the QIs: *Phoca vitulina* (Harbour Seal) [1365] and, if feeding on the shoreline, *Lutra lutra* (Otter) [1355] due to the remote risk to the SAC in the event of a catastrophic oil spill in the estuary	Yes
000212 Inishmaan Island SAC		Yes – for all QIs other than:]; European dry heaths [4030]; Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]; Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510], and; Limestone pavements [8240] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary.	Yes
000213 Inishmore Island SAC		Yes – for all QIs other than: European dry heaths [4030]; Alpine and Boreal heaths [4060]; Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]; Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]; Limestone pavements [8240], and; *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary.	Yes
000268 Galway Bay Complex SAC		Yes – for all QIs other than: Turloughs [3180]; *Juniperus communis* formations on heaths or calcareous grasslands [5130]; Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]; Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]; Alkaline fens [7230]; Limestone pavements [8240] and, if feeding on the shoreline, *Lutra lutra* (Otter) [1355] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary.	Yes
000278 Inishbofin and Inishshark SAC		Yes – for the QIs Coastal lagoons [1150] and *Halichoerus grypus* (Grey Seal) [1364] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary.	Yes
000332 Akeragh, Banna and Barrow Harbour SAC		Yes – for all QIs other than European dry heaths [4030] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary.	Yes
000343 Castlemaine Harbour SAC		Yes – for all QIs other than Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] due to remote risk to the SAC in the event of a catastrophic oil spill in the estuary	Yes

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
000365 Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC		Yes – for the QIs *Petromyzon marinus* (Sea Lamprey) [1095]; *Lampetra planeri* (Brook Lamprey) [1096]; *Lampetra fluviatilis* (River Lamprey) [1099], and; *Salmo salar* (Salmon) [1106], and for *Lutra lutra* (Otter) [1355] if feeding on the shoreline. There is also a potential pathway to impact *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] through *Salmo salar* in the event of a catastrophic oil spill in the estuary	Yes
000370 Lough Yganavan and Lough Nambrackdarrig SAC		Yes – other than for the QI *Geomalacus maculosus* (Kerry Slug) [1024] in the event of a catastrophic oil spill in the estuary	Yes
000375 Mount Brandon SAC		Yes – for the QI Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]. There is also a potential pathway to impact *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] through *Salmo salar* in the event of a catastrophic oil spill in the estuary	Yes
001021 Carrowmore Point to Spanish Point and Islands SAC		Yes – for the QIs Coastal lagoons [1150] and Reefs [1170] in the event of a catastrophic oil spill in the estuary	Yes
001257 Dog's Bay SAC		Yes – all QIs except European dry heaths [4030] in the event of a catastrophic oil spill in the estuary	Yes
001275 Inisheer Island SAC		Yes – for the QIs Coastal lagoons [1150] and Reefs [1170] in the event of a catastrophic oil spill in the estuary	Yes
001309 Omey Island Machair SAC		Yes – for the QI *Petalophyllum ralfsii* (Petalwort) [1395] in the event of a catastrophic oil spill in the estuary	Yes
001879 Glanmore Bog SAC		There is a potential pathway to impact *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] through *Salmo salar* in the event of a catastrophic oil spill in the estuary	Yes
002034 Connemara Bog Complex SAC		Yes – for the QIs Coastal lagoons [1150]; *Salmo salar* (Salmon) [1106] and *Lutra lutra* (Otter) [1355] if feeding on the shoreline in the event of a catastrophic oil spill in the estuary	Yes
002070 Tralee Bay and Magharees Peninsula, West to Cloghane SAC		Yes – for all QIs including *Lutra lutra* (Otter) [1355] if feeding on the shoreline except for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410], and Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) [91E0] in the event of a catastrophic oil spill in the estuary	Yes
002074 Slyne Head Peninsula SAC		Yes – for all QIs except: Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]; Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]; Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*. [3140]; European dry heaths [4030]; *Juniperus communis* formations on heaths or calcareous grasslands [5130]; Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]; *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]; Lowland hay meadows (*Alopecurus*	Yes

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
		pratensis, *Sanguisorba officinalis*) [6510]; Alkaline fens [7230], and; *Najas flexilis* (Slender Naiad) [1833] in the event of a catastrophic oil spill in the estuary	
002111 Kilkieran Bay and Islands SAC		Yes – for all QIs incl. *Lutra lutra* (Otter) [1355] if feeding on the shoreline, except for: Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130]; Lowland hay meadows (Alopecurus pratensis, *Sanguisorba officinalis*) [6510], and;*Najas flexilis* (Slender Naiad) [1833] in the event of a catastrophic oil spill in the estuary	Yes
002129 Murvey Machair SAC		Yes – for the QI *Petalophyllum ralfsii* (Petalwort) [1395] in the event of a catastrophic oil spill in the estuary	Yes
002158 Kenmare River SAC		Yes – for all QIs, including *Lutra lutra* (Otter) [1355] if feeding on the shoreline, except for: European dry heaths [4030]; *Juniperus communis* formations on heaths or calcareous grasslands [5130]; Calaminarian grasslands of the *Violetalia calaminariae* [6130]; Submerged or partially submerged sea caves [8330]; *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014], and; *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] in the event of a catastrophic oil spill in the estuary	Yes
002172 Blasket Islands SAC		Yes – for all QIs except European dry heaths [4030] in the event of a catastrophic oil spill in the estuary	Yes
002250 Carrowmore Dunes SAC		Yes – for all QIs except for *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] in the event of a catastrophic oil spill in the estuary	Yes
000093 Caha Mountains SAC	International Importance	No – none of the listed QIs are marine or shoreline located or dependent	No
000324 Rosroe Bog SAC		No – none of the listed QIs are marine or shoreline located or dependent	
000330 Tully Mountain SAC		No – none of the listed QIs are marine or shoreline located or dependent	
001228 Aughrusbeg Machair and Lake SAC		No – none of the listed QIs are marine or shoreline located or dependent	
001251 Cregduff Lough SAC		No – none of the listed QIs are marine or shoreline located or dependent	
001311 Rusheenduff Lough SAC		No – none of the listed QIs are marine or shoreline located or dependent	
002118 Barnahallia Lough SAC		No – none of the listed QIs are marine or shoreline located or dependent	
002119 Lough Nageeron SAC		No – none of the listed QIs are marine or shoreline located or dependent	
002130 Tully Lough SAC		No – none of the listed QIs are marine or shoreline located or dependent	
002185 Slieve Mish Mountains SAC		No – none of the listed QIs are marine or shoreline located or dependent	
002343 Tullaher Lough and Bog SAC		No – none of the listed QIs are marine or shoreline located or dependent	

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
RAMSAR Sites			
Tralee Bay	International Importance	Yes - due to the remote risk to the species and habitats of this wetland in the event of a catastrophic oil spill	Yes
Other Designated Sites			
Shellfish waters			
West Shannon Ballylongford (IEPA2_0061)	International Importance	Yes - due to the remote risk to the shellfish of this designated area in the event of a catastrophic oil spill	Yes
West Shannon Poulnasherry Bay (IEPA2_021)			
West Shannon Carrigaholt (IEPA2_0022)			
West Shannon Rinevella (IEPA2_0023)			
Tralee Bay (IEPA2_0020)			
Inner Bay, Maharees (IEPA2_0009)			
Ancient Woodland			
Carrowdotia South Possible Ancient Woodland (ALEW_ID: 1520)	National Importance	Yes - due to the proximity of this habitat to the proposed development	Yes
OSPAR sites			
Tralee Bay and Magharees Peninsula, West to Cloghane MPA (O-IE-0002978)	International Importance	Yes - due to the remote risk to the species and habitats of this marine environment in the event of a catastrophic oil spill	Yes
Nature Reserves			
Tralee Bay Nature Reserve	International Importance	Yes - due to the remote risk to the species and habitats of this nature reserve in the event of a catastrophic oil spill	Yes
Habitats recorded on site			
Scrub (WS1)		Yes, this habitat potentially occurs within the ZoI of the proposed development	Yes

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
(Mixed) Broadleaf Woodland (WD1)	Local Importance (Higher Value)		
Hedgerow (WL1) / Treelines (WL2)			
Sea walls, Piers and Jetties (CC1)	Local Importance (Lower Value)	Yes, this habitat potentially occurs within the ZoI of the proposed development	No
Building and Artificial Surfaces (BL3) and Bare Ground (ED2)			
Recolonising Bare Ground (ED3)			
Dry Meadows and Grassy Verges (GS2)			
Dry Humid Acid Grassland (GS3)			
Other Artificial Lakes and Ponds (FL8)			
Invasive Species recorded on site			
Sea-buckthorn (*Hippophae rhamnoides*)	N/A	Yes, this species was recorded within a number of locations within the proposed development, however, is not listed as a third schedule invasive species	No
Japanese Rose (*Rosa Rugosa*)			No
Fauna			
Marine Mammals	International Importance	Yes - marine mammals have been identified within the ZoI of the proposed development	Yes
Wintering birds		Yes - the project is immediately adjacent to an internationally important site for wintering birds. Additionally, a number of SCI species of the River Shannon and River Fergus SAC and BoCCI Red and Amber listed species were identified within the proposed development. It is noted that disturbance may also arise to identified potential *ex situ* foraging and loafing areas used by species.	Yes
Lesser horseshoe at roosts (confirmed or potential roosts)		One Lesser Horseshoe Bat roost was confirmed within the ZoI of the proposed development. No possible roost features will be removed during the development; however, disturbance cannot be ruled out.	Yes
Bat species foraging habitat features		Yes, foraging and commuting habitat occurs within the ZoI of the proposed development. This includes foraging habitat within the 2.5km foraging range of a Lesser horseshoe bat roost.	Yes
Badger Setts		Yes, potential badger setts were identified within the ZoI of the proposed development	Yes

Name Code	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZOI)	Key Ecological Receptor?
Otter holts and couches	Local Importance (Higher Value)	Yes – on precautionary basis given suitable habitat within the ZoI of the proposed development	Yes
Breeding birds		Yes - Suitable habitat for breeding birds occurs within the ZoI of the proposed development in particular hedgerows and woodland habitats. Additionally, a number of SCI species of the River Shannon and River Fergus SAC and BoCCI Red and Amber listed species were identified within the proposed development.	Yes
Other bat roosts (confirmed or potential roosts)		One bat roost (further surveys pending) was confirmed within the ZoI of the proposed development. No possible roost features will be removed during the development; however, disturbance cannot be ruled out.	Yes
Amphibian breeding habitat		Yes, features suitable for amphibian breeding occur in the ZoI of the proposed development	Yes
Sunfish (*Mola mola*)	Vulnerable status by IUCN Red List	The northern coastline of the Dingle peninsula (from Smerwick Harbour to Brandon Head)	Yes
Atlantic Leatherback turtles (*Dermochelys coriacea*)		Known to predate the same prey as *Mola mola*	Yes

10.6 Likely Significant Impacts

10.6.1 Do Nothing

In the Do Nothing scenario, the existing works area within the Moneypoint Generating Station will remain as is at present. There would be no change in the current impact of the site as on biodiversity. To maintain security of electricity supply it would be necessary to continue the operation of Moneypoint on coal in the do nothing scenario. The continued use of coal would have a knock-on effect on the development of the Green Atlantic @ Moneypoint which is proposed to provide a construction base for offshore wind development post 2025. The effect on biodiversity would likely remain unchanged from the current operations.

10.6.2 Construction Phase

The following outlines impacts identified associated with the works:

- **Habitat loss, Fragmentation and Disturbance:** The proposed development will result in the permanent loss of habitat.
- **Loss of resting, breeding and nesting sites:** There will be a loss of resting, breeding, and nesting features for species through permanent habitat removal or temporary use of an area in a way that renders such features unsuitable.
- **Noise and vibration disturbance:** There will be a temporary increase in noise and vibration due to the proposed development. Construction noise and vibration, especially associated with any piling works required, could affect birds and bats. Birds, both terrestrial and shoreline, might be affected up to 253m of the site. Otters and badgers might be affected up to 150m from the site. Bats might be affected up to 6km from the site. These moderate, temporary effects are not likely to result in significant effects as the site is industrial and most fauna using the area are likely habituated to the noise levels on-site.
- **Discharges (other than an oil spill at sea) to water:** There is a small potential for localised spills, e.g., of diesel fuel, engine oil, cement and other construction related chemicals and substances on site. With the existing drainage and bunding system, combined with current responses plans for such eventualities already in place, as well as new ones proposed, there is very little chance of impacts to the water quality of the estuary and its associated habitats.
- **Dust deposition:** Dust produced by the dismantling of structures in the coal yard, modification of the ash storage area, construction of the new auxiliary boiler building, the two new HFO tanks and ancillary buildings, as well as during movement of vehicles related to this work, may affect vegetation. Dust can impact vegetation by blocking the stomata of leaves and inhibiting transpiration and photosynthesis.
- **Light disturbance:** Local increases in light levels during the construction phase may impact habitat use and suitability for a number of sensitive receptors, such as otter, bats and badger, within the relevant ZoIs.
- **Visual disturbance:** Due to the temporary increase in personnel and machinery presence during construction phase of the proposed development, there may be disturbance to more sensitive receptor species, such as badger and otter.
- **Spread of invasive species:** There is potential for the introduction and/or spread of invasive species due to construction phase activities.

The potential for these to cause significant effects to KERs is outlined in Section 10.6.5.

10.6.3 Operation and Maintenance Phase

The following outlines potential impacts identified associated with the works:

- **Habitat loss and Disturbance:** There is potential for the operational phase of the proposed development to result in the temporary and permanent loss of Dry Humid grassland (GS3), Dry Meadows and Grassy Verges (GS2) and Scrub (WS1) within the ASA due to stripping, filling, ash reclamation and reinstatement works to be carried out as part of the proposed changes to landfilling arrangements and HFO plant operation.
- **Loss of resting, breeding and nesting sites:** Loss of resting, breeding, and nesting features for species may occur through habitat (see above) removal or disturbance during ongoing actions to be carried out within the grassland habitats in the ASA described above.
- **Generation of Air pollutants:** There is the potential for the generation of airborne pollutants capable of deposition within the wider landscape. Nitrogen and Acid deposition may have a significant impact on plant communities and water quality both adjacent to and away from the Generating Station. Detailed analysis, presented in Chapter 7 Air of the EIAR demonstrates, however, there would be no adverse effects on designated habitat sites. The assessment indicates that overall the PCs and PECs that the increases in NOx and SO_2 concentrations as a result of the proposed development are small relative to the background concentrations adopted for this assessment and would not result in exceedances of the AQS for NO_x or SO_2. On this basis, the direct impacts from atmospheric NO_x and SO_2 at ecological sites are negligible.
- Nutrient and Acid deposition: Critical loads (Nitrogen and acidification) – Contributions to nitrogen deposition (eutrophication) and acid deposition (acidification) at designated sites has been derived from the dispersion modelling, for designated sites including the Lower River Shannon SAC and Tullagher Lough and Bog SAC. The critical loads for nitrogen and acid deposition are greater than significance level of 1% of the minimum critical load; however, they will be less than for the current coal operation and there is, therefore, no potential for significant effects nor effects on vegetation qualifying interests. Such generation of air pollutants impacts are thus screened-out for these pathways.
- **Noise disturbance:** Operational phase noise at the proposed development will not change from the pre-existing levels. The site operates in line with an existing IE licence (Register Number: P0605-04. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. However, HFO ships are generally much smaller with an average payload of ca. 27,000 tonnes, or just over one full tank. This compares with an average ship payload of ca.180,000 tonnes for a coal ship. The existing jetty is designed to cater for shops with a payload of up to 200,000 tonnes. It takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship. Underwater noise will be reduced as a result of the proposed development as the coal shipments are eliminated. In terms of operational noise, noise levels are modelled as being well below 55dB (ca. 30-40dB) – this is a low noise level effect (Cutts et al., 2013) and is not likely to have a significant effect on water birds.
- **Discharges to water:**
  - There is a notable, but remote, risk of accidental oil spillage, each with the potential to have potentially significant effects to the habitats and species within Shannon Estuary and waterbodies up to 120km away from the site. Oil spill might occur under any one of three key circumstances, namely,
  - In the estuary on approach to Moneypoint and because of collision, grounding or leakage of and from oil vessels
  - Accidental spillage of oil at the jetty during HFO tank filling operations, and
  - Potential leakages of oil from tanks and pipes on site during operation of the generation station.

  - There is a small potential for localised spills / discharge, e.g., of chemicals, hydrocarbons and sediment on site. With the existing drainage and bunding system, combined with current responses plans for such eventualities already in place, as well as new ones proposed, there is very little chance of impacts to the water quality of the estuary and its associated habitats.
  - Process wastewater discharges will not change, and the existing emission limit value will continue to be complied with.
- **Dust deposition:** as a result of movements of FGD to the ASA, as well as necessary work in the management of the ASA, there is potential for the creation of dust and for this to affect vegetation, whereby dust particles block the stomata of leaves and inhibit transpiration and photosynthesis.
- **Light disturbance:** Changes to and increases from the existing light levels are proposed following installation of additional lights within the proposed development that will run during the operation of the proposed development.
- **Noise and visual disturbance:** There is potential for a temporary increase in personnel and machinery presence during HFO delivery events which may disturb species, however these events will be brief and infrequent (ca. two events per year).
- **Spread of invasive species:** There is already potential for the introduction and/or spread of invasive marine species via all vessels entering the Shannon estuary, but the overall number of ships required for the proposed Development will not result in a significant increase in ship numbers (1 per annum). There is, however, still a chance that HFO delivery vessels, as a result of biofouling on ship hulls, will result in the introduction of invasive species.

The potential for these to cause significant effects to KERs is outlined section 10.6.5.

10.6.4 Decommissioning Phase

The partial dismantling and removal of the vulnerable coal handling plant and infrastructure has been discussed in Section 10.6.2 and is considered to be part of the construction phase.

Works during the dismantling phase are anticipated, applying a worst-case approach, to be similar to those during construction as similar types of activities would be undertaken. Therefore, where the potential for decommissioning to cause significant effects to KERs exists, these have been assessed under the section on Construction Phase (Section 10.6.2).

Decommissioning of the Moneypoint Generating Station is not due to occur until at least 2029 pending respective planning permissions. The decommissioning of the overall wider site is planned as part of the phasing out of fossil fuel sourced energy production and will provide an opportunity to support renewable energy infrastructure. Decommissioning Management Plan (DMP) and Closure, Restoration and Aftercare Management Plan (CRAMP) has been submitted to and agreed with the EPA in accordance with condition 10 of the IEL. On decommissioning some of the structures on site may be used for future developments such as those which may be linked to the Green Atlantic @ Moneypoint project which is in the early design and feasibility study stages.

10.6.5 Assessment of Impacts on KERs

The key ecological receptors within the various ZoIs of the proposed development are evaluated in accordance with the evaluation criteria set out in Section 10.3 of this Chapter. The existing baseline condition / population stability, conservation status, rarity and legal protection of the key ecological receptors was considered as part of this evaluation.

10.6.5.1 Internationally Designated Sites

Designated sites, and their associated QIs and SCIs, and with potential for impact were identified as KERs.

Mott MacDonald prepared a screening for Appropriate Assessment and Natura Impact Statement report (which accompanies this application) that investigated the potential for the proposed development to have significant effects on European Site(s) either alone or in combination with other plans or projects.

The screening report concluded "*that it cannot be excluded on the basis of objective evidence, and in view of best scientific knowledge, and the in the absence of any measures intended to avoid or reduce harmful effects on European sites, that there will not be any likely significant effects from the Proposed Development alone, and in combination with other plans or projects, on the following European sites only:*

- *SPAs:*
  - *River Shannon and River Fergus Estuaries SPA 004077*
  - *Mid-Clare Coast SPA 004182*
  - *Illaunonearaun SPA 004114*
  - *Magheree Islands SPA 004125*
  - *Blasket Island SPA 004008*
  - *Skelligs SPA 004007*
  - *Loop Head SPA 004119*
  - *Cliffs of Moher SPA 004005*
  - *Tralee Bay Complex SPA 004188*
  - *Kerry Head SPA 004189*
  - *Dingle Peninsula SPA 004153*
  - *Inishmore SPA 004152*
  - *Iveragh Peninsula SPA 004154*
  - *Beara Peninsula SPA 004155*
  - *Slyne Head to Ardmore Point Islands SPA 004159*
  - *Cruagh Island SPA 004170*
  - *Deenish Island and Scariff Island SPA 004175*
  - *Connemara Bog Complex SPA 004181*
  - *Mid-Clare Coast SPA 004182*
  - *Inishbofin, Omey Island and Turbot Island SPA 004231*
  - *Castlemaine Harbour SPA 004029*
  - *Inner Galway Bay SPA 004031*
  - *The Bull and The Cow Rocks SPA 004066*
  - *High Island, Inishshark and Davillaun SPA 004144*
  - *Puffin Island SPA*
- *SACs*
  - *Lower River Shannon SAC 002165*
  - *Black Head Poulsallagh Complex SAC 000020*
  - *Inagh River Estuary SAC000036*
  - *Glengarriff Harbour and Woodland SAC 000090*

- *Inishmaan Island SAC 000212*
- *Inishmore Island SAC 000213*
- *Galway Bay Complex SAC 000268*
- *Inishbofin and Inishshark SAC 000278*
- *Slyne Head Islands SAC 000328*
- *Akeragh, Banna and Barrow Harbour SAC 000332*
- *Ballinskelligs Bay and Inny Estuary SAC 000335*
- *Castlemaine Harbour SAC 000343*
- *Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC 000365*
- *Lough Yganavan and Lough Nambrackdarrig SAC 000370*
- *Mount Brandon SAC 000375*
- *Carrowmore Point to Spanish Point and Islands SAC 001021*
- *Dog's Bay SAC 001257*
- *Inisheer Island SAC 001275*
- *Omey Island Machair SAC 001309*
- *Glanmore Bog SAC 001879*
- *Connemara Bog Complex SAC 002034*
- *Tralee Bay and Magharees Peninsula, West to Cloghane SAC 002070*
- *Kilkieran Bay and Islands SAC 002111*
- *Murvey Machair SAC 002129*
- *Kenmare River SAC 002158*
- *Blasket Islands SAC 002172*
- *Carrowmore Dunes SAC 002250*
- *Magharee Islands SAC 002261*
- *Valencia Harbour/Portmagee Channel SAC 002262*
- *Kerry Head Shoal SAC 002263*
- *Kilkee Reefs SAC 002264*
- *Kingstown Bay SAC 002265*
- *West Connacht Coast SAC 002998*"

The potential impacts identified within the NIS for the above designated sites are outlined in Table 10.7.

Table 10.7: Potential Effects identified to European Site due to Construction and Operation Phase Activities

European Site	Impact to QIs/SCIs Identified
River Shannon and River Fergus Estuaries SPA	Due to the proximity of the proposed development to this SPA, there is potential for disturbance effects during the construction phase of the proposed development, in the absence of mitigation.
	In the unlikely event of a catastrophic oil spill occurring in the estuary, there is potential for effects to the SCIs of the SPA.
	There is also potential for the spread of invasive species via shipping vessels in the absence of mitigation.
Mid-Clare Coast SPA	In the unlikely event of a catastrophic oil spill occurring in the estuary, there is potential for effects to the SCIs of the SPA.
	There is potential for the spread of invasive species via shipping vessels in the absence of mitigation.
Illaunonearaun SPA	In the unlikely event of a catastrophic oil spill occurring in the estuary, there is potential for effects to the SCIs of the SPA.
Magheree Islands SPA	
Dingle Peninsula SPA	
Blasket Island SPA	
Skelligs SPA	
Loop Head SPA	
Cliffs of Moher SPA	
Tralee Bay Complex SPA	
Kerry Head SPA	
Lower River Shannon SAC	Due to the location of this SAC within one or more of the ZoIs identified for the proposed development, there is potential for some or all of the QIs to be subject to: ● pollution events in terms of water quality at construction and operational stage ● disturbance effects to QIs at construction and operational stage ● introduction and/or spread of invasive species during the construction stage and via shipping vessels during the operation stage in the absence of mitigation
000020 Black Head Poulsallagh Complex SAC	In the unlikely event of a catastrophic oil spill occurring in the estuary, there is potential for effects to some or all of the QIs of the SAC (see Table 10.6 and the AA/NIS).
000036 Inagh River Estuary SAC	
000090 Glengarriff Harbour and Woodland SAC	
000212 Inishmaan Island SAC	
000213 Inishmore Island SAC	
000268 Galway Bay Complex SAC	
000278 Inishbofin and Inishshark SAC	
000328 Slyne Head Islands SAC	
000332 Akeragh, Banna and Barrow Harbour SAC	
000335 Ballinskelligs Bay and Inny Estuary SAC	
000343 Castlemaine Harbour SAC	
000365 Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	
000370 Lough Yganavan and Lough Nambrackdarrig SAC	
000375 Mount Brandon SAC	

European Site	Impact to QIs/SCIs Identified
001021 Carrowmore Point to Spanish Point and Islands SAC	
001228 Aughrusbeg Machair and Lake SAC	
001257 Dog's Bay SAC	
001275 Inisheer Island SAC	
001309 Omey Island Machair SAC	
001879 Glanmore Bog SAC	
002034 Connemara Bog Complex SAC	
002070 Tralee Bay and Magharees Peninsula, West to Cloghane SAC	
002074 Slyne Head Peninsula SAC	
002111 Kilkieran Bay and Islands SAC	
002129 Murvey Machair SAC	
002158 Kenmare River SAC	
002172 Blasket Islands SAC	
002250 Carrowmore Dunes SAC	
002261 Magharee Islands SAC	
002262 Valencia Harbour/Portmagee Channel SAC	
002263 Kerry Head Shoal SAC	
002264 Kilkee Reefs SAC	
002265 Kingstown Bay SAC	
002998 West Connacht Coast SAC	
Tralee Bay Ramsar site	In the unlikely event of a catastrophic oil spill occurring in the estuary, there is potential for effects to the SCIs of the SPA.

In summary, potential **temporary to permanent significant adverse effects** are identified in the absence of mitigation to the above European sites. The mitigation measures detailed in the accompanying NIS have been carefully considered to ensure there will be no adverse effects on the integrity of the European Sites specified and have been done so in light of the sites' conservation objectives and status.

Based on the assessment of the proposed development alone, and in combination with other projects and plans, and including the implementation of mitigation measures, it can be concluded that no adverse effects on the sites' integrity, and in view of the sites' conservation objectives, will arise. The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the Project on the integrity of the relevant European sites.

10.6.5.2 Nationally Designated Sites

All NHA and pNHA within the various ZoIs are coincident with European sites, as outlined in Section 10.4.1.2. and the potential for impacts to these sites are as outlined in Section 10.6.5.1 in relation to European Sites.

Only one pNHA, Farrihy Lough pNHA (000200), was also identified to be a KER as, in the unlikely event of a catastrophic oil spill, there is potential for effects to *ex-situ* bird species in the estuary.

Additional information in relation to degradation of habitats and impacts on avifauna associated with these sites is outlined below. In summary potential **temporary to permanent significant adverse effects** are identified in the absence of mitigation.

10.6.5.3 Other Designated sites

The following other designated sites were identified as KERs:

- Shellfish waters
  - West Shannon Ballylongford (IEPA2_0061)
  - West Shannon Poulnasherry Bay (IEPA2_021)
  - West Shannon Carrigaholt (IEPA2_0022)
  - West Shannon Rinevella (IEPA2_0023)
  - Tralee Bay (IEPA2_0020)
  - Inner Bay, Maharees (IEPA2_0009)
- OSPAR Sites
  - Tralee Bay and Magharees Peninsula, West to Cloghane MPA (O-IE-0002978)
- Nature Reserves
  - Tralee Bay Nature Reserve
  - Derrymore Bay Nature Reserve
  - Mount Bandon Nature Reserve
  - Tearaght Island Nature Reserve
  - Little Skellig Nature Reserve Great Skellig Nature Reserve

These sites are coincident with European sites as outlined in Section 10.4.1.2. The potential for impacts to these sites, in relation to European Sites, is outlined in Section 10.6.5.1. Additional information in relation to degradation of habitats within, and impacts on wintering birds associated with, these sites is outlined in Section 10.6.5.13. In summary, potential **temporary to permanent significant, adverse effects** are identified in the absence of mitigation.

10.6.5.4 Terrestrial Habitats

Scrub (WS1, Fossitt 2000) and Mixed Broadleaf woodlands (WD1, Fossitt 2000) were the only habitats identified as KERs that exist within the redline boundary. The proposed development will involve clearance of 0.1 hectares of scrub (WS1) habitat within the Moneypoint Generating Station south of the N67. Additionally, ca. 1.5 hectares of Scrub and ca. 0.4 hectares of (Mixed) Broadleaf woodland (WD1) were identified within the central section of the ASA where the storage of the additional ash and FGD by-product is to be accommodated. Disturbance/ permanent removal of some of this habitat will be required to facilitate this supplementary storage although this removal is allowed under permitted development (Ref.14/373) for the site. As noted in Section 4.2.4, it is also proposed to increase the thickness of the FGD/Ash capping layer from 0.6 m up to a maximum of 1.6 m in order to store all the FGD by-product produced during the years 2025 to 2029. This coupled with a reduced quantity of ash to be stored overall will result in a reduced height of up to 1.85m when compared to what was granted under permission P14/373 while maintaining the same profile.

There will also be a disturbance/ removal ca. 26.7 hectares of bare ground habitats, that have developed over time and as part of current operation of the site, due to part of the proposed operational changes to the ASA.

There is potential for indirect effects on Scrub, (Mixed) broadleaf woodland and linear woodland habitats due to the generation and deposition of dust during construction and operational (ash storage and reclamation) phases.

In the absence of mitigation, there will be a permanent loss or temporary disturbance to of up to 1.6 hectares of woodland / scrub habitats of local importance (higher value) as outlined above with site clearance activities and changes to the ASA arrangement.

Non-KER habitats recorded, namely: Sea walls, Piers and Jetties (CC1), Bare Ground (ED2), Recolonising Bare Ground/ Dry calcareous and neutral grassland (ED3/GS1), Dry Meadows and Grassy verges (GS2) and Dry-humid grassland (GS3); have some ecological value and localised impacts may arise. Mitigation for such is outlined in Section 10.8.

Overall, these impacts are assessed as a **medium-to-long-term, moderate negative** effects at a local scale.

10.6.5.5 Invasive species

No 'Third Schedule' invasive species were identified within the boundary of the proposed development but there remains a risk of introduction of such on land and at the construction phase, e.g., via works and traffic, as well as at sea, via boats delivering HFO, during the operational phase. The introduction and spread of non-native invasive species to sensitive and ecologically important areas within the proposed development and surrounding area has the potential to result in a **long-term, likely significant negative effect** at a local scale.

10.6.5.6 Rare and Protected Flora

No protected flora was recorded, either through surveys or during the desk study. No impacts are likely, but on a precautionary basis, confirmatory, preconstruction plant surveys are to be carried out.

Overall, potential impacts are assessed as **unlikely, slight negative effects** at a local scale.

10.6.5.7 Freshwater Ecology and Water Quality

The potential for effects on surface water features as a result of the construction phase associated with drainage is discussed in Chapter 11.

No natural surface waterbodies were identified within the proposed development area, with the Molougha stream having been culverted and now flowing beneath the ASA. There is, therefore, no direct risk to freshwater habitats due to the proposed works within or immediately adjacent to the proposed development.

A number of artificial waterbodies (artificial ponds and drainage) are noted within and immediately adjacent to the proposed development, but as these flow directly into the estuary to the south and through a series of interceptors, there is no risk to the freshwater environment and or freshwater fisheries. No significant direct impacts were identified.

10.6.5.8 Marine Fisheries

There is potential, as a result of possible catastrophic oil spill, for there to be a **temporary to long-term, significant impact** on fish in the estuary and further afield up to 120km.

10.6.5.9 Other Marine Ecology

The potential for effects on other marine surface and sub-surface water features, as a result of the construction phase and associated with drainage, are discussed in EIAR Chapters 11 and 12.

The Shannon Estuary is located immediately south of the proposed development and acts as the receiving environment for all water that leaves the proposed development. It is to be noted that outflows from the Moneypoint Generating Station pass through a series of interceptors and that the marine receiving environment is relatively robust in its ability to buffer additional inputs.

By the precautionary principal, impacts such as water pollution, resulting from possible engine oil or fuel spills / silt runoff/ cement discharge etc., have potential to add to pollution loads within the estuary, potentially impacting benthic habitats, marine mammals and birds etc., both inside and outside SACs and SPAs. This has the potential to result in **temporary, slight impacts** to marine ecology.

Catastrophic oil spill in the estuary could result in a **temporary to long-term, significant impact** on benthic habitats, marine mammals and birds, both inside and outside the SACs and SPAs in the estuary and further afield up to 120km. These are discussed in Section 10.6.5.1 of this Chapter and in detail in the AA/NIS report.

10.6.5.10 Badger

Although no badger setts were identified within the redline boundary of the proposed development during our survey, badger activity and setts have been recorded within the Moneypoint Generating Station by other surveyors. Setts, burrows and other signs of badger were noted within the woodland to the immediate north of the redline boundary. Additionally, given the landscape within which the proposed development is located (agricultural grassland), there is potential for setts to be located outside of the footprint of the proposed development. These setts may be subject to temporary noise and vibration effects during the construction phase up to 150m away.

In addition, there is potential for additional direct impacts and disturbance effects should additional badger setts become established within the ZoI in the time period following the survey and prior to construction.

There is also potential for the removal of foraging habitat (scrub and grassland) following the proposed changes to the landfilling arrangements to the ASA.

In the absence of mitigation, these impacts are assessed as **short term, moderate negative effects** at a local scale.

10.6.5.11 Otter

Two otter couches and a number of field signs of otter were recorded within the ZoI of the proposed development. Additionally, there is potential for holts to become established within the ZoI in the time period following the survey and prior to construction, with a number of areas along the pier and coastal defence structures found to offer suitable habitat. There is, therefore, potential for direct impacts and disturbance effects to otter.

The impacts are assessed on a precautionary basis as **temporary, moderate negative effect** at a local scale, in the absence of mitigation.

10.6.5.12 Breeding birds

Woody vegetation clearance and grassland habitat removal has the potential to result in a loss of nesting and foraging habitat for breeding bird species in the local area. It is noted that the grassland habitat will be re-established once the ASA has reached the end of its life.

In addition, should clearance be carried out during the nesting season (1st March-31st August), there is potential for direct impact to nesting birds within woody habitats within the Proposed

Development. The disturbance of these species during the construction phase has potential to result in temporary movement out of the ZoI.

The Ecological Survey for Birds report, completed by others, noted the use of the proposed development and immediate vicinity by a number of BoCCI amber listed, and one red listed, species.

It is noted that there is ample suitable breeding habitat within the locality.

Overall, the impacts to breeding birds is assessed to be a **temporary-to-short-term, moderate negative effect** at local scale, in the absence of mitigation.

10.6.5.13 Wintering birds

Wetland birds have been documented to tolerate noise levels at or below 55dB(A) (Cutts, 2013). The noise study (please see Chapter 9) found that, in general, noise from the construction phase works will fall to below the 55dB threshold at the shoreline. Two activities were, however, identified with the potential to exceed this limit due to the proximity of the planned works to the shore, namely piling works for the new tanks, auxiliary boilers [hydraulic hammer rig] and the dismantling of structures in the coal yard.

The noise study found that operational noise should fall below the 55dB(A) threshold at the shoreline. There will be no significant impact on the wintering bird populations within the ZoI of the proposed development due to operational phase noise impacts.

Bird surveys undertaken by others, noted use of the proposed development and immediate vicinity by 14 SCI species of the adjacent River Shannon and River Fergus Estuaries SPA, with the ASA noted to be used by a number of BoCCI Amber-, and one Red-listed, species.

It is noted that ample, suitable foraging and roosting habitat for wintering birds is noted within the wider locality, however, due to the proximity of the proposed development to the internationally important River Shannon and River Fergus Estuaries SPA, there is potential for noise effects associated with the construction phase to result in significant disturbance to SCI species.

In the absence of mitigation, this construction phase disturbance has been assessed as a **temporary, slight negative effect** to bird populations at a local scale.

10.6.5.14 Bats

Surveys did not identify any bat roost features within the footprint of the proposed development. One building with moderate potential bat roost features was identified immediately adjacent to the redline boundary, with one further roost feature identified to the north of the woodlands and the proposed development. The second feature is a confirmed roost of Annex II species, Lesser Horseshoe Bat. The Bat Assessment carried out by BatEco Services notes that the area surveyed was "*used extensively as a roosting, foraging and commuting habitat for local bat populations. The number of bat species recorded, and the level of bat activity indicates that the survey area is an important area for local bat populations, particularly lesser horseshoe bats*".

It is noted that no works are to be carried out on either of these structures, although there is potential for disturbance effects to foraging habitat during the construction phase.

Noise levels are to fall between 30 and 45dB(A) at the confirmed roost locations. This does not pose a significant risk of noise disturbance to these species.

Temporary lighting installed at construction phase may alter bat foraging and roosting behaviour. The potential disturbance of these species due to lighting during the construction phase has been assessed to be a **temporary, significant negative effect** at local scale. New

permanent lighting to be installed at the HFO bund and utilised during the operation phase is to be used when required, this has been assessed to be a **short term, slight, negative effect** at a local scale.

Whilst it's possible for potential roost features to form in trees prior to the commencement of the construction phase, none of the trees located within the woody habitat, and that are due to be cleared, currently have, or are old enough to have, such features.

Loss of habitat has the potential to result in loss and/or degradation of foraging habitat for bat species in the wider landscape. The loss of trees with potential foraging habitat, has the potential to result in a **permanent, slight negative effect** at a local scale due to loss of suitable woodland type foraging habitat (as outlined under potential impacts to habitats).

10.6.5.15 Amphibians

No amphibians or field signs of such species were encountered during field surveys. While features with the potential to support breeding frogs were encountered, these were highly altered artificial habitats (artificial ponds and drainage ditches). Additionally, no works are to be carried out within these surface waterbodies. There is potential for impacts to amphibians near the proposed development. As such, there is potential for a **temporary, slight negative effect** on local population of amphibians.

10.6.5.16 Woodland Habitat

Good examples of WN1/WN2Oak-birch-holly woodland / WN2 Oak-ash-hazel woodland, and classified as Possible Ancient Woodland (ALEW_ID: 1520) by NPWS, is located immediately north of the boundary of the proposed development. There is potential for dust generated during the construction and operational phases to affect this habitat and impact its ability to photosynthesise. As such, there is potential for a **short-term, slight negative effect** at a local scale.

10.6.5.17 Oil spill

There is a risk that in the unlikely events of a catastrophic oil spill within the estuary there could be a risk to the above mentioned KERs and non-KER features at the proposed development and within the wider landscape. Oil spills from shipping vessels have the potential to significantly adversely affect seabirds (including many of the listed SCIs for SPAs in the 120km zone), aquatic species (such as sea-going stages of QIs listed from relevant SACs in the 120km zone), marine mammals (such as QIs *Phoca* vitulina [harbour seal] and *Tursiops truncatus* [common bottlenosed dolphin]) and estuarine and coastal QI SAC habitats (such as annual vegetation of drift lines [1210], embryonic shifting dunes [2110], shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] etc.). It is estimated that 0.5 to 8.4 million tonnes of petroleum oil per year are released into the marine environment, with approximately 35% of this volume due to shipping and drilling rigs (Troisi *et al*., 2016).

Seabird populations are particularly vulnerable due to their distribution, foraging and breeding behaviour. If oil smothers a bird, it can cause suffocation and it can disrupt feather integrity, leading to loss of waterproofing, thermal insulation and buoyancy, resulting in birds not being able to dive or fly and preventing them from feeding. If the birds are preening and feeding, the polycyclic aromatic hydrocarbons (PAHs) found in oils, can have chronic effects and result in pathological changes in the intestinal tract, lungs, liver, kidneys and salt gland (Troisi *et al.,* 2016).

In relation to otters, oil can cause their fur to mat, preventing insulation and this can lead to hypothermia. The ingestion of oil during cleaning can cause liver and kidney failure and cause severe damage to their lungs and eyes.

Regardless of the very unlikely chance of occurrence (see Section 10.3.3), such events have the potential to have a **very significant to profound, long-term to permanent, potentially irreversible effect** on the above mentioned KERs and non-KER features at the proposed development and within the wider landscape.

10.7 Cumulative Effects

An assessment of projects with the potential for cumulative effects in association with the proposed development was undertaken.

A search of planning applications was conducted (see Section 5.5.9) to identify the potential for in-combination effects with the proposed development.

Overall, it can be concluded that there are no in-combination effects of the proposed development with any other projects. The identified projects, along with the rational for their exclusion from creating in-combination effects, are shown in Table G.2 in Appendix G of this EIAR.

10.7.1 Summary

Construction and operation phase impacts, associated with the Moneypoint Generating Station development are assessed as potentially **significant effects at the local geographic scale** to specific biodiversity receptors detailed.

It is noted that in the unlikely event of an oil spill in the estuary, this assessment increases to a **very significant to profound long-term to permanent potentially irreversible effects.**

Mitigation for the project alone (Section 10.8) is outlined which is relevant for the Moneypoint Security of Supply project and other projects.

10.8 Mitigation and Monitoring Measures

Mitigation measures were designed having regard to the Mitigation Hierarchy. This is a sequential order of mitigation actions, whereby the preference for mitigation measures is as outlined below:

- Avoidance: Steps to avoid harm to biodiversity.
- Minimisation: Where adverse effects cannot be avoided, action is taken to minimise these effects.
- Compensation: Only considered after all possibilities for avoidance and minimisation of effects have been implemented.

Careful consideration has been taken throughout the design process to use existing infrastructure (e.g., reconfiguration of existing plant, ducting, roadways etc negating the need to undertake extensive works as part of this proposed development.) as this will ultimately minimise potential impacts to the surrounding habitats. As such, substantial mitigation through avoidance and minimisation has already been achieved. Additional mitigation measures to further avoid and/or minimise potential impacts (described in Section 10.7, above), are outlined hereunder.

10.8.1 Mitigation Measures

10.8.1.1 Environmental Clerk of Works (EnCoW)

An Environmental Clerk of Works (EnCoW) will be employed to oversee implementation of mitigation and deliver toolbox talks and preconstruction confirmatory ecology surveys, as appropriate. This will include monitoring and auditing works and programmes, as well as works

method statements, to ensure mitigation is correctly implemented and that impacts to KER habitats, and other non-made ground habitats, preferably avoided, or at least minimised, where practical.

The EnCoW will also manage consultation with environmental bodies including the NPWS and IFI. The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents.

It will be ensured that the EnCoW is delegated sufficient powers under the construction contract so that they will be able to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation/clean-up operations. The EnCoW will also ensure any disturbance licenses are arranged if any significant findings are determined from confirmatory pre-construction surveys outlined above. The EnCoW will advise on implementation of appropriate mitigation measures, including scheduling of works, and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised.

10.8.1.2 Monitoring of Mitigation Measures

During construction, monitoring will be carried out, and reported by the EnCoW, with regard for relevant conditions and licenses where required.

Monitoring is necessary in close proximity to known bat roost features noted in Sections 10.4.5.1 and 10.4.5.5 and at badger setts found in Section 10.6.5.

The specific intervals at which the monitoring will take place will be determined by the relevant ecologist, having regard for licenses, and planning conditions.

10.8.1.3 Pre-Construction Confirmatory Surveys

In advance of any enabling works, the EnCoW will commission pre-construction, confirmatory surveys of identified significant ecological receptors, to update the findings of the surveys outlined in Section 10.4. Such surveys will specifically confirm and update presence, distribution etc. of such receptors. These will then be used to inform any revisions to proposed mitigation plans. The exact nature and number of pre-construction confirmatory surveys will depend on the time that has elapsed between when the original surveys were undertaken and works on the proposed Development start. As a minimum, the following will be needed ahead of any works.

- Otter holts and couches within 150m;
- Badger setts within 150m;
- Potential bat roosts within 420m of the development;
- Invasive species within the proposed development site.

Should a longer period (+> 12 months) elapse between last survey and the start of works, other pre-construction surveys might also be needed, such as:

- Demarcated Local Importance (Higher value) habitats and works areas to minimise impacts and monitor works;
- Breeding birds within 253m;
- Wintering Birds within 253m;

The EnCoW will ensure that confirmatory surveys on habitats of Local Importance (Higher value) or higher are caried out in accordance with '*Best Practice Guidance for Habitat Survey and Mapping'*.

The confirmatory otter surveys will be carried out having regard to guidance of NRA. The locations of otter couches noted within the Baseline Ecology report along with areas identified as suitable for otter holting will be thoroughly surveyed. Signs of otter including individual otters, holts, couches/resting sites, spraints and gland secretions, footprints and paths and slides will be recorded.

The confirmatory badger surveys will be carried out having regard to Surveying Badgers and record signs of badgers including tracks, hair, latrines and setts within the Annex I Broadleaf forestry north of the Moneypoint Generating Station south of the N67 where potentially active badger setts have been identified. The area north of the N67 which includes the ASA and surrounding grass and woody habitats is also to be included within the survey area. The extent of survey area for badger surveys will be defined with regard to Guidelines for the Treatment of Badgers during the Construction of National Road Schemes as 150m beyond all works areas within suitable habitat.

All surveys will be undertaken by a suitably qualified ecologist(s) will be carried out by an ecologist, but who will have demonstrable experience in the survey and assessment of the feature. The results of pre-construction confirmatory surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping.

Survey reporting and mapping will also be provided to the Employer's Representative team.

10.8.1.4 Mitigation for the Compensation and Retention of Habitats

Table 10.8 summarises the potential for retention of key habitat features, such as drainage ditches, scrub, treelines and hedgerows, as well as replanting of woody vegetation species, to mitigate for the loss of scrub and hedgerow.

Table 10.8: Landscaping Mitigation of Habitat KER Loss

Habitat	Estimate of Area Which May Be Lost	Mitigation
Scrub (WS1)	Permanent loss of 0.1 hectare of habitat within the Moneypoint Generating Station site.	Clearance of scrub will be kept to the minimum required to facilitate works with only areas of scrub within the redline boundary permitted to be removed. Please see below for Reinstatement works.
	Potential disturbance or temporary loss of up to 1.5 hectares of habitat within the ASA.	Clearance within scrub habitat will be kept to the minimum required to facilitate ash and FDG by-product storage.
Broadleaf Woodland (WD1)	Potential disturbance or temporary loss of up to 0.4 hectares of habitat within the ASA.	Clearance within woodland habitat will be kept to the minimum required to facilitate ash and FGD by-product storage.

Habitat Establishment/ Recreation

On completion of each landfill cell within the ASA, the cell will be capped using an optimised stabilised FGD by-product mixture. It is proposed to increase the thickness of the FGD/Ash capping layer from 0.6 m up to a maximum of 1.6 m in order to store all the FGD by-product produced during the years 2025 to 2029. As was previously permitted, once complete the final profile will resemble a dome-like shape and will be finished with a layer of topsoil and seeded with meadow grass mix of native provenance.

If and where possible, all grassland habitats and (recolonising) bare ground habitats located within the ASA will be reseeded using local seed mixes, where possible, under the supervision and direction of the EnCoW. Plant species of native provenance will be used in all replanting of semi-natural habitats. It is preferable, and from a pure ecology and pollinator perspective, that no reseeding takes place and that the natural seedbank existent within the originally removed

and then reinstated topsoil, is allowed to regrow. An appropriate mowing regime will be established to allow for the maintenance of these grassland habitats.

10.8.1.5 Mitigation for Disturbance and Dust Control

Construction Lighting

All temporary lighting associated with construction works will be placed strategically by the appointed EnCoW such that illumination beyond the works area is controlled, with light spill eliminated from areas surrounding important resting and foraging habitats such as the shoreline, woody habitats and the disused building identified as having moderate bar roost potential in Section 10.4.5.5. Lighting will be cowled and directional to reduce significant light splay. Column height of lights will be carefully considered to minimise light spill, less than 8m where possible[140].

Operational Lighting

Lighting will be cowled and directional to reduce significant light splay. Column height of lights will be carefully considered to minimise light spill, avoiding areas surrounding important resting and foraging habitats such as the shoreline, woody habitats and the disused building identified as having moderate bat roost potential in Section 10.4.5.5. Lighting at night will be via automatic sensors and will only activate when needed, focussing on buildings, away from natural areas including the Shannon estuary, shoreline habitats, woody habitats that act as important foraging, commuting and resting areas and confirmed bat roosts, badger setts and otter couches.

Construction and Operational Noise

- Noise will be sustained over a temporary period, particularly from piling works (if needed) and this has the potential to impact species in the woodland to the north of the site. A noise barrier will, therefore, need to be erected around piling works and/or between the development site and the woodland to the north for the duration of piling works or other particularly noisy operations.
- It is noted that the development of the project design and construction methodology may result in a changes in the mitigation requirements for noise in order to comply with the relevant criteria. The assessment of noise impacts on the KER will be updated during the detailed design stage and the corresponding mitigation requirements will be confirmed based on latest and best available information.
- During operations, and based on noise modelling that has been conducted, noise levels will be below 55dB and will, therefore, have negligible effects on species. No additional mitigation is proposed during the operational phase.

Dust

Mitigation measures needed for the control of dust are set out in the EIAR Chapter 7 Air, in Sections 7.7.1.2 and 7.7.1.3.

10.8.1.6 Mitigation for Pollution Control

As noted in Section 4.2.2, the existing bund will be upgraded to include a concrete floor across the entire bund. New bund walls will be constructed from reinforced concrete to ensure containment volumes taking into account 110% of the largest tank oil volume, a potential extreme rainfall event to cover any emergency response periods and any potential firefighting

[140] Bats & Lighting, Guidance Notes for: Planners, Engineers, Architects and Developers (Notice Nature, Bat Conservation Ireland, 2010)

water to take into account requirements in the Guidance Note to Industry on Fire Water Retention Facilities (EPA, 2019) and CIRIA Guidance C736.

All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for '*Environmental Good Practice on Site'* (C741) and '*Control of water pollution from construction projects. Technical guidance*' (C648), as discussed in Chapter 11 and Chapter 12.

Delineation of Works Areas

Prior to the works commencing, all works area will be demarcated with construction fencing. No construction works will occur outside of the delineated areas.

Stockpiling Material

- All excavated material will be stored a minimum of 50m from the Shannon estuary and any drainage ditches hydrologically connected to the watercourse.
- Silt fences, or gravel drains, will be positioned around stockpiles to capture surface water runoff. The silt fences and gravel drains will be regularly inspected and maintained.
- The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Visual monitoring of the silt fence will be undertaken regularly and after significant rain. Silt fences will be repaired, replaced or reinforced as necessary to prevent migration of silt.
- Stockpiled material, comprising soil, earth, stone etc., will be covered in order to prevent surface water runoff.
- Sediment control in the construction stage is important to ensure that only high quality, treated runoff leaves the site. Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments will be provided for on-site if required during the construction stage. Erosion control measures include:
  - Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction.
  - Monitoring of the weather forecast prior to planning excavation works.
- Other drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided adjacent to excavations and installed before starting site clearance and earthworks if deemed necessary by the supervising Engineer.

Concrete

The pouring of concrete will be required for foundation works associated with the new fuel tanks and auxiliary boilers.

To prevent the runoff of concrete, the following measures will be implemented:

- If onsite concrete batching is required, this will need to take place in controlled, bunded area. Dust suppression will be required, and all materials needed for concrete production stored undercover from rain and/or within the bunded area to prevent runoff. Noise suppression techniques will be utilised at the batching plant and/or the plant will be placed within the required noise barrier.
- Quick setting concrete mixes will be used, where possible, to reduce the risk of contaminated runoff to nearby watercourses or the Shannon estuary.
- Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite. Any concrete wash water will be retained temporarily on site, and prevented from entering the drainage network. The temporary storage will be in place until the management of the wash

water (either treatment or disposal) is agreed with the appropriate agency and in accordance with the best practice and the CEMP.

- It will be ensured that covers are available for freshly poured concrete and these will be used to avoid wash off in the event of rain.
- As it will not be possible to cover the whole HFO bund floor while the concrete is drying, work will have to be undertaken only in a suitable weather window. It should also be noted that the HFO bund is a basin and as long as the shut off valve is closed, there is no possibility of any runoff. Attention will be paid to ensure that the shut off valve is closed during concreting operations. Existing IE Licence Emission Limit Values (ELVs) for all drainage from the site, including for pH on that line (SW2) will be complied with throughout the construction and operational phases.
- Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal.
- Concrete works will be scheduled during dry weather conditions whenever possible to reduce the elevated risk of runoff.

Operational discharge of process water

Process water discharged from the proposed auxiliary boiler house will connect to the existing system that discharges to the Shannon Estuary at IEL emission point SW2. Outputs from this process water discharge will be limited such that the overall discharge will not exceed the existing IEL flow limits of 25m^3/hour or 400m^3/day. In addition to this, current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2, such as pH, mineral oil, suspended solids, and ammonia (as N), will continue to be complied with.

Hydrocarbons

- Where mobile equipment is required, e.g., generators, these will be housed in a suitably sized bund/'plant nappy' such that any leaks/spills are intercepted. All mobile equipment used at the proposed stormwater outfall will be stored within a 'plant nappy'.
- Any chemicals and/or hydrocarbons required on site during the construction phase will be stored in designated, impermeable areas and be bunded or double skinned.
- Fuelling and lubrication of plant and equipment will be carried out on impermeable surfaces or using mobile drip trays, and will be restricted to the construction site compound only. No refuelling will be permitted to occur within 50m of the estuary or drainage ditches.
- All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Acts 1996, as amended.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in when it should be deployed.
- Welfare/hygiene facilities will be located within the construction compound and contractor village, a minimum of 50m from any watercourse/drainage ditch.
- All water from wheel washes will be captured and removed from site and disposed of in line with Waste Legislation. No water will be discharged into any watercourses or drainage ditches.

Measures to prevent and control an oil spill from the tankers

During the transit of the HFO vessels within the Lower River Shannon Estuary ESB will ensure that all oil tankers shipping the HFO will have regard the International Safety Guide for Oil Tankers and Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS). In addition, the recommendations of the International Maritime Organisation will be reviewed and implemented, as necessary.

Measures in place in the event of a spill in the Shannon Estuary

The section also sets out measures to be instigated in the event of an accidental oil spill during operations. These measures and procedures will continue to be implemented during the operational phase of the proposed development. ESB are also in the process of reviewing the following in consultation with Shannon Estuary Anti-Pollution Team (SEA-PT):

- HFO delivery / unloading procedures;
- Stockpile of spill / emergency response equipment, including oil booms;
- Emergency / spill response procedures and agreements.

ESB are committed to providing the necessary equipment to satisfy SEA-PT and update procedures as required in advance of the filling of the proposed new HFO tanks.

ESB Moneypoint Oil Spill Response Plan within the site

Moneypoint has an Oil Spill Response plan in place which is executed in the event of a spill of oil. In the event of an oil spill within the Moneypoint site, the immediate assessment and actions by the Operations Team Leader or Designated Team Member are illustrated in Figure 10.4.

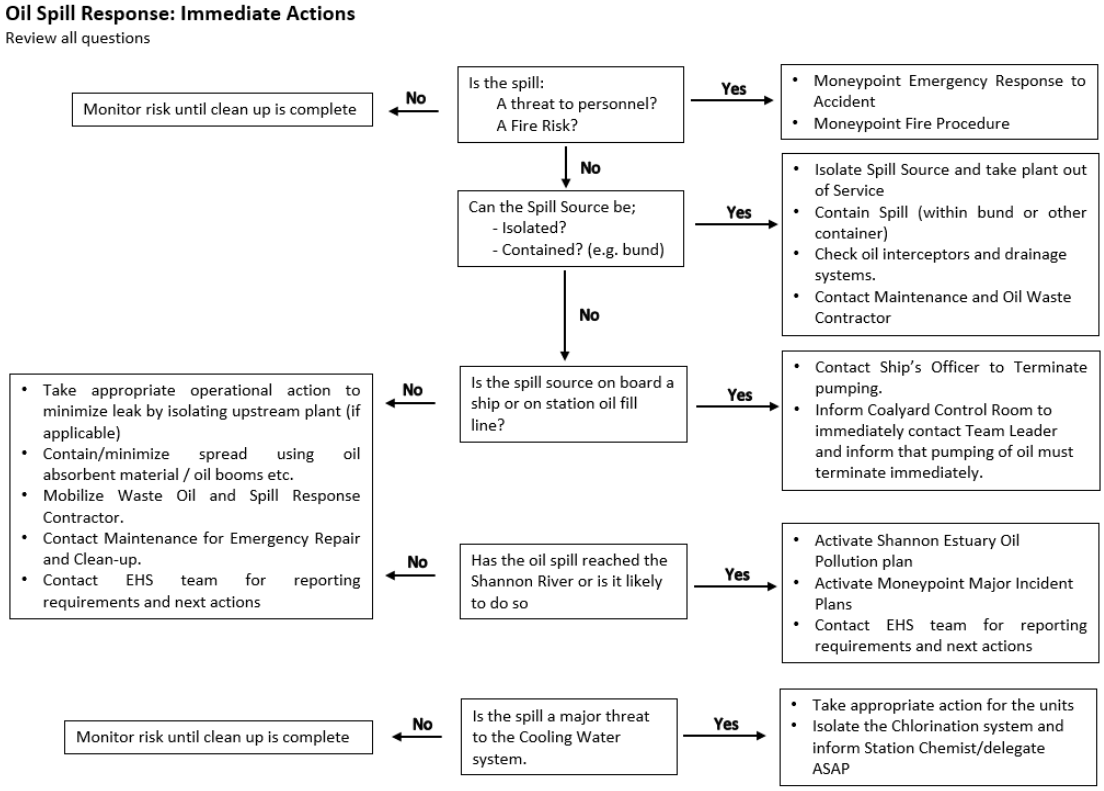
The plan contains measures to be implemented in the event of an oil spill, including:

- Discovery and notification of the appropriate personnel.
- Identification of a Tier 1, 2 or 3 incident:
  - Tier 1: a Tier 1 incident is one in which a small spill can be dealt with by personnel in the immediate vicinity and that has no external impact. Each installation / works area in the area of the plan has enough equipment to respond to a Tier 1 incident. In the event of a Tier 1 being activated, the spiller or installation personnel will respond in accordance with their local procedures and the Duty Harbour Master will monitor the response.
  - Tier 2: a Tier 2 incident is one that will require the combined resources of the organisations represented on the SEA-PT team. It will also require the involvement of regulatory bodies, local authorities, advisors and advisory bodies. In general, all spills in the Shannon Estuary, other than minor ones, will require a Tier 2 response. A Tier 2 response will require the activation of Shannon Foynes Port Company (SFPC) Incident Management Team and the SEA-PT. This will instigate notifications to the Coast Guard and Local Authorities and Tier 2 response specialists.
  - Tier 3: a Tier 3 incident is a major oil pollution event with potential for environmental, social and economic impacts that are beyond the capability of local resources. It will require local, national and probably international resources. A Tier 3 response is initiated by contacting the Coast Guard. A response at this level will be coordinated under the National Contingency Plan and within the Management of Major Emergencies Framework.
- Incident notification and response process is detailed.
- Tier escalation matrix is provided.
- An Incident Response and an Incident Action Plan are in place.
- ESB has a supply of oil booms available, and this is also a requirement for the IE licence.

It should also be noted that the last remaining operational HFO fired electricity generating unit at Tarbert Generating station (TB3), located across the estuary at Tarbert, Co. Kerry and operated by SSE Airtricity, officially closed in December 2023. Units TB1, TB2 and TB4 ceased normal operation during 2021 and officially closed in December 2023 (source: Pg 37 & 80 of EirGrid SONI GCS 2023-2032). It is estimated that around 540,000 Tonnes HFO per year would have been consumed at Tarbert when the plant was fully operational as a mid-merit plant. This would equate to ca.14 HFO ship deliveries at 40,000 tonnes each. A representative of Tarbert

confirmed that HFO deliveries to the site, when it was fully operational, averaged ca.12 to 14 per year and that ships of 35,000-40,000 tonnes were the more common ship sizes. These HFO deliveries in the estuary to Tarbert have, therefore, have now ceased with no proposal for them to recommence in the short to medium term, reducing the traffic of HFO tanker ships in the estuary.

Figure 10.4: Oil Spill Response Plan



Source: ESB

- Major environmental damage can be controlled and prevented by prompt isolation and containment of an oil spill – isolating local drains using absorbent booms, securing the area against traffic, containing the spill and monitoring oil interceptor outlets to detect oil spill to the Shannon.
- ESB carry out regular emergency preparedness exercises are conducted to ensure all staff are aware of measures to be implemented during emergency events.

Measures in place for HFO unloading

The following measures are in place and will continue to be implemented during HFO unloading:

- Oil unloading arm and valves on the jetty are manned at all times.
- The full length of the HFO fuel line is inspected periodically (current frequency every 2 hours)
- Pressure and temperature is constantly checked and recorded
- Radio contact is maintained with the ship, the control room and persons involved in the procedure
- The oil sump located underneath the jetty is emptied prior to arrival of the oil ship
- Security is maintained on the jetty while unloading
- Fire fighting equipment is positioned in place prior to arrival of the oil ship

- Oil spill containment equipment is located on the jetty
- Oil dry is positioned on the jetty (currently 2 tonne minimum)
- Jetty Oil Unloading Arm Area and HFO tank head space designated as ATEX Areas
- Hot work and smoking is prevented while unloading is taking place
- The pipework and valves are maintained as per Oil Tank & Pipework Technical Standard

Measures to prevent and address an oil spill from the HFO tanks on site

- All storage tanks, containers and drum storage areas that contain HFO will have leak containment bunds and leak detection systems in place.
- All chemicals stored on the site will be regulated under the IE licence. All fuels and chemical stored on site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH.
- In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities.
- Following the accidental release of HFO within the existing HFO bund on 05 May 2021 (see Section 12.4.2.1 of EIAR Chapter 12 Lands, Soils and Hydrogeology), additional measures are now in place. A quantitative risk assessment was also conducted and found that the risk of HFO migrating laterally through groundwater and beyond the site boundary impacting the Shannon Estuary was very low and likewise for migrating along the impacted drain. The following measures have been implemented as a result of this accidental release:
- All shifts were briefed as to the significance of this incident and the potential damage which could have been caused to the station.
- All tanks in the oil farm have alarmed level indicators fitted.
- The signage in the oil farm was brought up to standard.
- The SOPs (Standard Operating Procedures) were reviewed.

10.8.1.7 Mitigation for the Protection of Mammals

Mitigation for the protection of Otter

Should the confirmatory survey result in the requirement for any exclusion zones, these will be established and subsequently monitored by the EnCoW for compliance.

Should holts be identified within 150m of the proposed development the following will, at a minimum, be employed, unless otherwise agreed with the NPWS:

- No works will be undertaken within 150m of holts where breeding females or cubs are present.
- Works within 150m of such a holt can only take place following consultation and in agreement with the NPWS.
- No wheeled or tracked vehicles of any kind will be used within 20m of active but non-breeding holts.
- No light work, such as digging by hand or scrub clearance will take place within 15m of such holts, except under license from NPWS.
- Identified exclusion zones will be fenced and clearly marked on site prior to any invasive works.

- All contractors on site will be made fully aware or the procedures in relation to the holts by the EnCoW.

Mitigation for the Protection of Badger

As outlined previously, and prior to works commencing, a preconstruction survey for badgers will be undertaken. Where active badger setts have been identified within the ZoI of the proposed development, the use of camera monitoring, setting of footprint traps, soft blocking of the sett entrance or similar will be required to confirm their presence.

A description of the setts, i.e., main sett, annex sett, or outlier sett will be provided along with the level of activity at each. This will allow for an understanding of the importance of the setts in the wider context of the local population.

As per the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes, where setts have been confirmed, no heavy machinery will be used within 30m (unless carried out under licence from the NPWS). Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance, and light work, such as digging by hand or scrub clearance, will not take place within 10m of sett entrances.

None of the above works will be undertaken within 50m of active setts during the breeding season (December to June inclusive). An assumption that the sett is active will apply unless proven otherwise during the course of investigation. Where works may interfere with the badger sett directly, exclusion will take place as per NRA guidelines.

All identified exclusion zones, as outlined above, will be clearly marked out on site and communicated to all site staff prior to works commencing.

Mitigation for the Protection of Bats

The design and construction of bat mitigation measures has had regard to relevant documents, including: the NRA's "Guidelines for the Treatment of Bats During the Construction of National Road Schemes"[141], the NPWS Bat Mitigation Guidelines for Ireland[142], and (with specific regard to roosts in trees), the Bat Tree Habitat Key[143].

Two bat roost features have been identified as likely to be disturbed by the Proposed Development. As stated above in Section 10.8.1.5, construction and operational lighting will be sympathetically considered and operational lighting at night will be via automatic sensors and will only activate when needed, focussing on buildings, away from natural areas.

Any trees that may require felling will be examined for presence / absence of bats or bat roosts immediately prior to felling and any features in trees, identified from ground level as of medium or high suitability, will be climbed and/or accessed by a Mobile Elevated Working Platform. They will be inspected using a digital endoscope to confirm the ground-level rating, and where possible identify presence / absence of roosting bats. Where timing facilitates it (i.e., when felling is being undertaken during the active season for bats from May to September inclusive), emergence surveys may additionally be carried out to confirm presence / absence of roosting bats, subject to the advice of the bat ecologist, and any licence conditions. Where felling does not occur within one day of the examination, trees will need to be re-assessed, unless otherwise agreed with the NPWS.

[141] https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Bats-during-the-Construction-of-National-Road-Schemes.pdf

[142] http://battreehabitatkey.co.uk/

[143] Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

Mitigation for the protection of other mammals protected under the Wildlife Act

Implementation of mitigation for breeding birds, is outlined in Section 10.8.1.8, This same mitigation will simultaneously provide protection for pygmy shrew and hedgehog, as the majority of their main breeding seasons run from April-October. Stoat, that breed in May-June (Hayden and Harrington, 2001) will also be covered by the same measure, as will hare, as although they have been recorded breeding in every month, spring to summer is thought to be the peak period.

10.8.1.8 Mitigation for Protection of Breeding Birds

In accordance with Section 40 of the Wildlife Acts, the removal of vegetation which may be used as nesting sites by breeding birds, will be cleared outside of the birds nesting season (1st March to 31st August inclusive).

Should clearance be required during the bird breeding season, a suitably qualified ecologist will conduct pre-construction surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event that pre-construction confirmatory surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance). Within these exclusion zones, no vegetation clearance may proceed until young are fledged, or nesting has failed. Repeat surveys will be required if vegetation has not been cleared within 72 hours of the survey taking place.

10.8.1.9 Mitigation for Breeding Birds and Wintering Wildfowl

Breeding birds and Wintering wildfowl have been recorded within the proposed development boundary (on land, mostly around the ASA) and within the 253m ZoI set for disturbance effects. The following mitigation will be implemented to ameliorate noise and visual disturbance effects.

- Noise maybe sustained over a temporary period, particularly from piling works (if needed) and this may impact wintering wildfowl on site. It is therefore recommended that a temporary noise barrier be erected around piling works and/or between the development site and the ASA.
- Ongoing monitoring of the barrier will be undertaken to ensure it is installed correctly and identify any defects for the contractor to remedy.
- All plant shall be operated and maintained in accordance with the manufacturer's recommendations, including use and maintenance of the specific noise reduction measures, such as:
  - The use of mufflers on pneumatic tools
  - Effective exhaust silencers
  - Sound reducing enclosures
  - Machines in intermittent use shall be shut down during periods where they are not required.
- Noise modelling that has been conducted to assess likely noise levels during operation have determined that noise levels will be below 55dB and, therefore, will have negligible effects on species. No additional mitigation is therefore proposed during the operational phase.

10.8.1.10 Invasive Species Control Measures

Construction Phase

No Third Schedule Invasive Species were identified within the ZoI proposed development, although, there is potential for invasive species to have become established within or adjacent to the works areas following baseline surveys, and before construction. As a result:

- Prior to works commencing, a full invasive species survey will be carried out. The pre-construction invasive species survey will be carried out within the works areas, including compound locations and laydown areas, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas.
- The invasive species survey will be carried out during the appropriate growing season (May – October). The findings of this invasive species survey will be incorporated into the measures below, by the Contractor's EnCoW and any specialists.
- Any stands of invasive species recorded within the ZoI will be clearly marked out as restricted areas. Such exclusion zones will incorporate a 4m buffer, appropriate to the species found, such that below ground growth is accounted for (4m for Japanese knotweed[144] buffer not required for other species). No works will be carried out within the exclusion zones unless approved by the EnCoW.
- The EnCoW will carry out a toolbox talk for all construction personnel. This will provide information on how to identify and manage invasive species and will take place prior to works commencing in any areas where Invasive Species have been recorded.
- All machinery will be steam-cleaned prior to entering and before leaving site.

Operation Phase

Ships carrying HFO to Moneypoint shall adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM).

In order to minimise the transfer of invasive marine aquatic species, it is recommended that the 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (Resolution MEPC.378 (80), adopted on 7 July 2023) are followed, including the following measures:

- An Anti-Fouling System (AFS) will be installed and maintained.
- Reinstalling, reapplying or repairing the AFS will be regularly undertaken in accordance with manufacturer's guidance and include measures for surface preparation to facilitate good adhesion and durability.
- A ship-specific contingency action plan, based on specific triggers from monitoring of biofouling parameters, will be described in the Biofouling Management Plan (BFMP).
- The contingency action plan will include:
  - proactive actions that can be implemented to lower the risk of biofouling accumulation if a higher biofouling risk may be predicted owing to planned operational changes
  - corrective actions to an operating profile, maintenance or other repair plans, if monitoring identifies an early indication of elevated risk.
  - occasional inspection to determine biofouling accumulation and if the monitoring of biofouling parameters identifies an indication of prolonged elevated risk.
- The ship-specific BFMP will include, but not necessarily be limited to, the following:
  - identification of the officer, or the position (e.g. chief engineer), responsible for the BFMP, ensuring that the plan is properly implemented
  - details of the AFS installed and where it is installed
  - details of the recommended operating conditions suitable for the selected AFS to avoid deterioration of AFS, including recommended conditions such as temperature, salinity, speed

[144] Fennell, M., Wade, M., Bacon, K., (2018); Japanese knotweed (*Fallopia japonica*): An analysis of capacity to cause structural damage (compared to other plants) and typical rhizome extension

- details of expected AFS efficacy throughout AFS lifetime including the need for inspection or maintenance, if relevant
- description of monitoring on biofouling risk parameters
- regime for cleaning, if any
- details of hull and niche areas where biofouling may accumulate
- schedule for fixed inspections of areas
- procedures for reactive cleaning actions that will be performed if triggered by inspection results
- contingency action plan based on specific triggers from monitoring of biofouling risk parameters
- regime for repairs, maintenance and renewal of AFS, when relevant, in accordance with the manufacturer's instructions
- process for monitoring and maintenance of MGPS as per the manufacturer's instructions to ensure their effectiveness in minimizing biofouling
- details of the documentation/reports required to document biofouling activities.

10.9 Residual Impacts

With the implementation of mitigation measures the proposed development will not result in significant impacts. During the construction and operational phases, impacts on fauna sensitive to disturbance (noise, light and visual), Annex I habitats, water quality and associated aquatic receptors are anticipated to be localised, short term in duration and of slight significance.

11 Surface Water Resources and Flooding

11.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on various surface water aspects such as water quality and flooding. The assessment is based on the development as described in Chapter 4 of this EIAR. Existing water quality in the vicinity of the proposed development site is established from desktop sources. Proposed mitigation measures to prevent, reduce and/or offset the anticipated potential impacts are presented as appropriate.

An assessment of the likely and significant impacts arising from the proposed development on hydrogeology is presented in Chapter 12 Land, Soils and Hydrogeology of this EIAR.

11.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Surface Water Resources and Flooding chapter are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

11.2.1 Legislative Context

The documents have been used to inform this chapter of the EIAR.

- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 (as amended by S.I. No. 296/2009; S.I. No. 386/2015; S.I. No. 327/2012; and S.I. No. 77/2019 and giving effect to Directive 2008/105/EC on environmental quality standards in the field of water policy and Directive 2000/60/EC establishing a framework for Community action in the field of water policy, i.e. Water Framework Directive (WFD); and
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), which gave legal effect to the Water Framework Directive in Ireland.

11.2.1.1 Water Framework Directive

The WFD 2000/60/EC commits EU member states to achieve good qualitative and quantitative status of all inland and coastal waters at six-year intervals.

The WFD classification scheme for surface water quality includes five status classes: High, Good, Moderate, Poor and Bad based on the biological and supporting physicochemical (nutrients, oxygen condition, temperature, transparency, salinity and river basin specific pollutants (RBSPs)) and hydromorphological quality elements.

The Biological Quality Elements are phytoplankton, macrophytes, phytobenthos, benthic invertebrate fauna and fish.

The overall ecological status relates to the biological and physicochemical parameters. Overall ecological status classification for a waterbody is determined, according to the ‘one out, all out’ principle, by the element with the worst status out of all the biological and supporting quality elements.

Good status means achieving satisfactory quality water, suitable for local communities' drinking, bathing, agricultural, industrial and recreational needs, while maintaining ecosystems that can support all the species of plants, birds, fish and animals that live in these aquatic habitats.

While the overall objective of the WFD is to achieve good status for all waterbodies, some waterbodies require extra protection by virtue of their location in a protected area or their function as a drinking water or bathing water. In accordance with the requirements of the WFD and the associated national regulations a register of protected areas has been set out for each River Basin District in Ireland. The protected areas are identified as those requiring special protection under existing National or European legislation, either to protect the surface water resource, or to conserve habitats or species that directly depend on those waters.

The different protected areas included in this register are European drinking water protected areas, designated waters such as fish protected areas and shellfish protected areas, nitrates vulnerable zones, urban wastewater sensitive areas and bathing water protected areas.

11.2.1.2 EU ‘Floods’ Directive 2007

The national flood risk policy aligns with the requirement of the EU ‘Floods’ Directive (2007/60/EC). The Directive requires EU Member States to coordinate their flood risk management practices in shared river basins and to take account of long-term developments, including climate change, and sustainable land use practices in preparing flood risk management plans. The EU ‘Floods’ Directive is to be carried out in coordination with the WFD.

The EU ‘Floods’ Directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations 2010, S.I. No. 122 of 2010 and amended by the European Communities (Assessment and Management of Flood Risks) (Amendment) Regulations 2015, S.I. No. 495 of 2015.

11.2.2 Guidelines

Regard has also been had to the following guidance documents:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009), hereafter referred to as the National Roads Authority Guidelines
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016)
- Planning for Watercourses in the Urban Environment: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate/Flood Risk and Recreational Planning (Inland Fisheries Ireland, 2020)
- Control of Water Pollution from Construction Sites - Guide to Good Practice (C532) (CIRIA, 2001)
- River Basin Management Plan for Ireland 2018 - 2021 (Department of Housing, Planning and Local Government, 2018)
- Draft River Basin Management Plan for Ireland 2022 – 2027 (Department of Housing, Planning and Local Government, 2022)
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Office of Public Works, OPW, 2009), hereafter referred to as the Flood Risk Guidelines
- Flood Risk Management, Climate Change Sectoral Adaptation Plan (OPW, September 2019)

11.2.2.1 Climate Change

As a result of global warming, the Earth's climate will change and it is expected that over the next 100 years, Ireland will experience significant changes in rainfall characteristics and increased sea levels around the coast. The climate also has implications for the sizing of drainage systems.

The latest Climate change guidance[145] has been considered in this study when assessing the impact of future climate change on flood risk.

11.2.2.2 Flood Risk

The Flood Risk Guidelines[146] aim to integrate flood risk management into the planning process to assist the delivery of sustainable development. They aim to encourage a transparent and consistent consideration of flood risk in the planning process.

The objectives of the Flood Risk Guidelines are given as:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water runoff;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

A Flood Risk assessment was carried out by ESB for the proposed development (EIAR Appendix H – Document no. QP-000017-65-R460-002-000). A copy of this report is appended to this EIAR (See Appendix H).

11.3 Methodology

11.3.1 Approach to Data Collection

The following information and data sources (Table 11.1) have been considered during the production of this EIAR.

Table 11.1 Data Sources used to inform the Surface Water Resources and Flooding chapter of this EIAR

Data source	Date	Data contents
Environment Protection Agency Water Framework Ireland Map viewer databases	Various	WFD status, risks and objectives
Environment Protection Agency Water Quality in Ireland 2016-2021	2019	Water quality
Environment Protection Agency WFD Status 2016-2021	2019	WFD status, risks and objectives
EPA 2022 EcoStatus Value and Assessment Technique	2022	WFD status where unassigned
Clare County Council (flood risk assessments /studies/mapping)	Various	Identified flood risk

[145] Flood Risk Management, Climate Change Sectoral Adaptation Plan, prepared by the Office of Public Works, September 2019

[146] The Planning System and Flood Risk Management, Guidelines for Planning Authorities, prepared by the Office of Public Works, November 2009

Data source	Date	Data contents
OPW Flood Mapping (https://www.floodinfo.ie/map/floodmaps/)	Various	Identified flood risk / historical flood events
Topographical data (including drone surveys carried out by ESB in 2023)	Various	Flood risk
Tailte Éireann (Ordnance Mapping)	Various	Flood risk

11.3.2 Approach to Impact Assessment

The impact assessment methodology applied is based on that described in Chapter 4 as adapted to make it applicable to the assessment of surface water resources and flooding.

The surface water impact assessment methodology is in accordance with the National Roads Authority Guidelines.

A separate Flood Risk Assessment has been undertaken (EIAR Appendix H, Document no. QP-000017-65-R460-002-000), in accordance with the Flood Risk Guidelines. Conclusions are included within this chapter.

The Flood Risk Guidelines categorise flood risk in the form of three Flood Zones. These Flood Zones each relate to geographical areas at high, moderate or low flood risk, depending on if they are Zone A, B or C respectively. Table 11.2 provides a definition of each Flood Zone.

The flood risk likelihood is defined as a percentage risk of occurring in any year. For example, a flood event may be described as having an annual exceedance probability (AEP) of 1%; this can also be written as a 1 in 100-year event. Critical infrastructure vulnerable to flooding should be located in Flood Zone C.

Table 11.2: Definition of Flood Zones

Flood Zone	Description
A	The AEP of flooding from rivers and seas is highest (greater than 1% AEP for flooding, or 0.5% AEP for coastal flooding).
B	The AEP of flooding from rivers and the sea is moderate (between 0.1% AEP and 1% AEP for river flooding, and between 0.1% AEP and 0.5% AEP for coastal flooding).
C	The probability of flooding from rivers and the sea is low (less than 0.1% AEP for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in Zone A or B.

Source: The Office of Public Works, The Planning System and Flood Risk Management, Guidelines for Planning Authorities (November 2009)

A desktop qualitative assessment has been undertaken to identify the baseline characteristics relating to the hydrology of surface waterbodies within the study area.

The significance of effects has been assessed in terms of the magnitude of the impact and the importance of that receptor, based on the criteria outlined in the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009). Table 11.3 outlines the criteria for rating site attributes, Table 11.4 sets out the criteria for rating magnitude and Table 11.5 sets out the criteria for rating significance.

Table 11.3: Criteria for Rating Site Attributes (NRA, 2009)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009)

Table 11.4: Criteria for Rating Impact Magnitude

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Loss or extensive change to a waterbody or water dependent habitat Increase in predicted peak flood level >100mm Extensive loss of fishery Calculated risk of serious pollution incident >2% annually Extensive reduction in amenity value
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm Partial loss of fishery Calculated risk of serious pollution incident >1% annually Partial reduction in amenity value
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level 10 - 50mm Minor loss of fishery Calculated risk of serious pollution incident >0.5% annually Slight reduction in amenity value

Magnitude of Impact	Criteria	Typical Examples
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level Calculated risk of serious pollution incident <0.5% annually
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009)

Table 11.5: Rating of Significant Environmental Impacts

Importance of Attribute	Magnitude of Impact			
	Negligible	**Small**	**Moderate**	**Large**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
High	Imperceptible	Moderate / Slight	Significant / Moderate	Severe / Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Source: Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009)

11.3.3 Limitations of this EIAR

There were no significant limitations or restrictions encountered during the compilation of this chapter of the EIAR. All third-party reports, data and mapping are assumed to be correct for the purposes of this chapter.

11.3.4 Study Area

The extent of the study area reflects the distance over which significant changes to the water environment are likely to occur. This distance is influenced by the physical extent of the works, the nature of the receiving environment and the way the effects may be propagated. It takes into account the land required permanently for the operation of the proposed development at Moneypoint Generating Station study area has been confined to the land required for the proposed development and the immediate receiving surface waterbodies.

11.4 Receiving Environment

The following sections present details of the receiving environment as it relates to surface water resources and flood risk.

11.4.1 Surface Water Quality

The Moneypoint Generating Station ownership boundary is wholly located within the Shannon Estuary North catchment (WFD Catchment 27) which includes the area drained by the River Fergus and all streams entering tidal water between Thomond Bridge and George's Head, Co. Clare, draining a total area of 1,658km^2. The largest urban area in this catchment is Ennis.

The Water Framework Directive (2000/60/EC) (WFD) provides a system for monitoring and classifying the quality of surface and groundwater which involves establishing the existing ecological and chemical status of each water body, setting environmental objectives and devising programmes of measures designed to meet those objectives. The WFD sets a target of aiming to achieve at least “good status” in all natural waterbodies and maintaining that status once achieved. Ecological status is measured on the scale: high, good, moderate, poor and bad. Chemical status is recorded as “good” or “fail”. The WFD also requires that ecological status or potential does not decline over time.

The Lower Shannon Estuary (European code: IE_SH_060_0300) adjacent to the south of the Moneypoint Generating Station is a transitional water body classified as being of Good Status (WFD monitoring period 2016-2021). The Lower Shannon Estuary is also classified as ‘Not at Risk’ in relation to failing to meet its WFD objectives of maintaining good status.

The existing Moneypoint Generating Station complex currently discharges storm water, cooling water and neutralised wastewater to the River Shannon Estuary.

According to watercourse mapping provided by the Environmental Protection Agency (EPA), one watercourse, the Mologha (EPA name, also referred to under its WFD name as Tonavoher_010), crosses through the Ash Storage Area for Moneypoint Generating Station. This watercourse is culverted beneath the Ash Storage Area before discharging into the River Shannon. A lagoon was constructed within the north-eastern area of the Ash Storage Area to capture and regulate the flow of the Mologha river before passing into the culvert. This lagoon is used to regularise water flows and deposition to occur before entering the culvert. This lagoon is also used as a source of water for dust suppression.

The water quality status of the two waterbodies in vicinity of site is presented in Table 11.6.

Table 11.6: WFD Waterbody Status (2016 - 2021)

Waterbody Name (WFD)	WB Code	Type	Waterbody WFD Status 2016 - 2021	WFD Risk Status
Lower Shannon Estuary	IE_SH_060_0300	Transitional waterbody	Good	Not at risk
Mologha (or Tonavoher_010)	IE_SH_27T230880	River waterbody	Moderate	Review

11.4.2 Protected Areas

The site boundary of the proposed development within the existing Moneypoint Generating Station complex partially coincides with the Lower River Shannon Special Area of Conservation (SAC) (site code 002165) within the south-eastern boundary and is adjacent to the River Shannon and River Fergus Estuaries Special Protection Area (SPA) (site code 004077). No other European Sites are in close proximity to the proposed development.

There are no Natural Heritage Areas (NHAs) within the boundary of the proposed development. The closest NHA to the proposed development is St Senan’s Lough NHA (site code 001025) located approximately 1.8km northeast of the Moneypoint Generating Station site. No source-pathway-links were identified between the NHA and the proposed development.

Cappagh Pier, Kilrush, is an EU designated bathing water area located approximately 4km northwest of the proposed development at Moneypoint Generating Station. This designated bathing water area is monitored by EPA and received an annual water quality rating of ‘Good’ for 2022 (the classification for 2023 has not been published at the time of writing).

11.4.2.1 Drinking Water and Abstractions

According to a review of EPA data, there are no licenced surface water abstraction points within the vicinity of the proposed development site, and potable water is not sourced within the vicinity of the site.

11.4.3 Nutrient Sensitive Areas

The Urban Waste Water Treatment Regulations 2001, as amended (which transpose the Urban Wastewater Treatment Directive (91/271/EEC) into Irish law and update the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations 1994, as amended) list nutrient sensitive waters in the Third Schedule. The section of the Shannon Estuary adjacent to Moneypoint Generating Station is not designated as a nutrient sensitive area.

11.4.4 Existing Surface and Storm Water Discharges and Infrastructure

The existing activities at the Moneypoint Generating Station currently operate under an IE Licence Register No. P0605-04 regulated by the EPA. The location of the existing emissions to water for the IE licence for the Moneypoint Generating Station complex are shown in Figure 11.1 and Figure 11.2.

Moneypoint Generating Station has 14 no. licensed emission points which are permitted to discharge to the Shannon Estuary. These emission points comprise of two storm water emissions points – SW4 and SW13, two foul wastewater discharges – SW3 (not in use) and SW10. The remaining ten emission points comprise fully or partially of process emissions.

The locations of emission points to water are illustrated in Figure 11.1, with the exception of SW15 which was never put into use. Additionally, SW3 is noted as being no longer in use as detailed in Table 11.7.

Table 11.7: Licenced Water emission locations and volumes

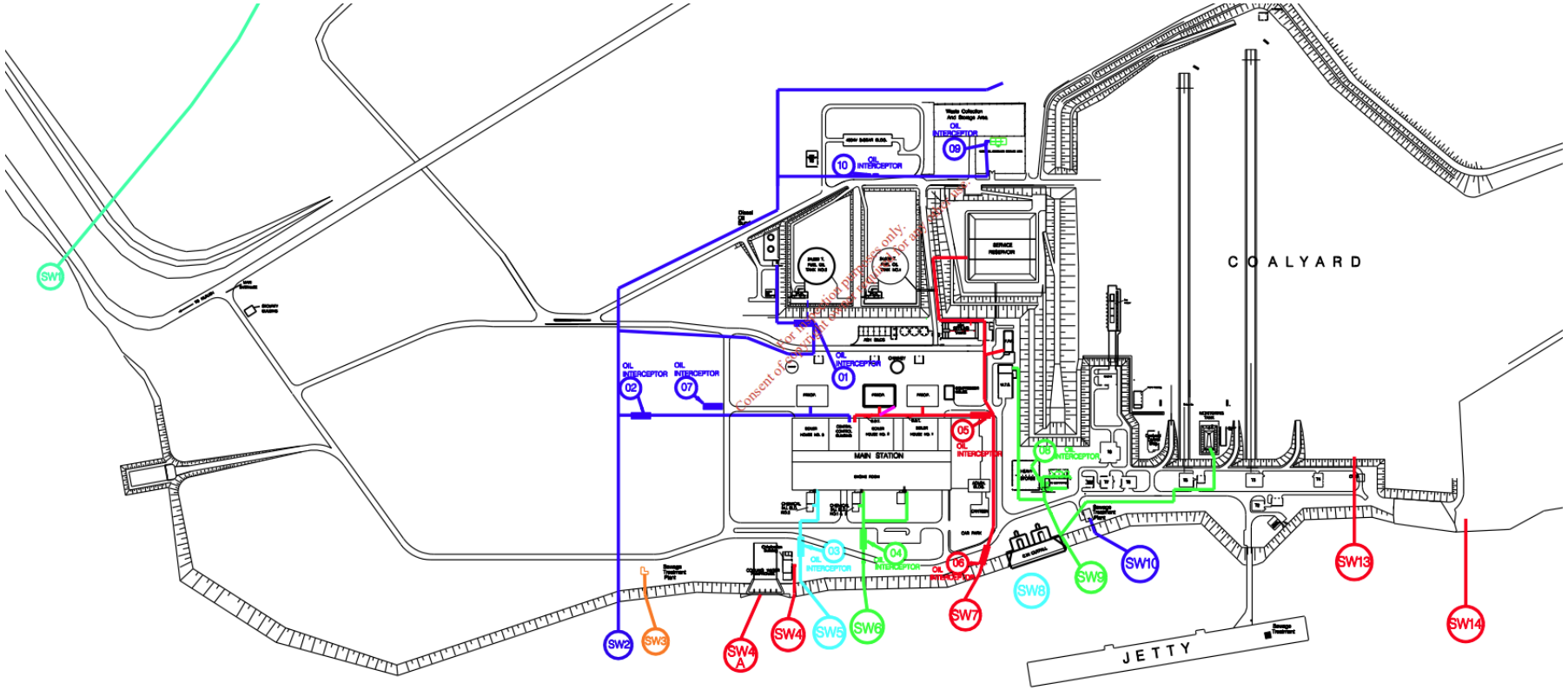
Emission Location Ref	Description of Discharge	Licenced volume of discharge (m^3)
SW1	Collects surface water from the Ash Storage Area which passes through a settlement tank before discharge	
SW2	Surface Drain No 2 - Unit 3 process water and station drainage, passes through an oil interceptor before discharge	Daily: 400 Hourly: 25
SW3 (Not in use)	Foul Drain No 1 - sanitary effluent	
SW4	Surface Drain No 3	
SW4A	Band Screen Wash Water discharges directly to the Shannon Estuary	Daily: 14,400 Hourly: 600
SW5	Surface Drain No 4 – main boiler drains and station drainage, pass through one of two interceptors before discharge	Daily 225
SW6	Surface Drain No 5 – main boiler drains and station drainage, pass through one of two interceptors before discharge	Daily: 225
SW7	Surface Drain No 6 – Neutralised water treatment effluent from Unit 1 & 2 process water, including demineralised water and station drainage, these discharges pass through an interceptor prior to discharge	Daily: 1200 Hourly: 50
SW8	Cooling Water Outfall – the main cooling water outfall from the unit condensers, which discharges directly to the Shannon Estuary	Daily, 2,760,000 Hourly: 115,00

Emission Location Ref	Description of Discharge	Licenced volume of discharge (m^3)
SW9	Collects water from the area northeast of the water treatment building and from coalyard run off, this discharges through an oil interceptor prior to discharge	Daily: 300 Hourly: 50
SW10	Foul Drain No 2 – sanitary waste is treated in an on-site septic tank prior to discharge	
SW13	Surface Drain No 8 – FGD landfill area – recycled through RGD lagoon, and passes through an oil interceptor prior to discharge	
SW14	Coal yard FGD lagoon – this discharge is recycled and reused within the power generation process on site	
SW15 (Not in use)	Surface water collected from FGD by-product landfill Area A	

Figure 11.1: Locations of emission to water

Source: Extract from ESB drawing QS-000139-01-D460-1010, Attachment E.1 - Licence Review P0605-04

Figure 11.2: Location of emissions to water and associated drainage



Source: Extract from ESB drawing MP-325728, Map 3 IE licence 0605-03, Environmental Management System - Location of Interceptors, ESB

The largest volume discharged to the Shannon Estuary originates from SW8 - the main cooling water outfall from the unit condensers, located at the southern end of the site (see Figure 11.2). The licensed daily maximum and hourly maximum discharge volumes for all emission points are listed in Table 11.7.

Emissions to water are controlled and monitored in accordance with IE licence P0605-04, with monitoring required at each of the emissions points to water, Table 11.8 lists the monitoring parameters for each emission point.

Table 11.8: Licence monitoring parameters for emissions to water

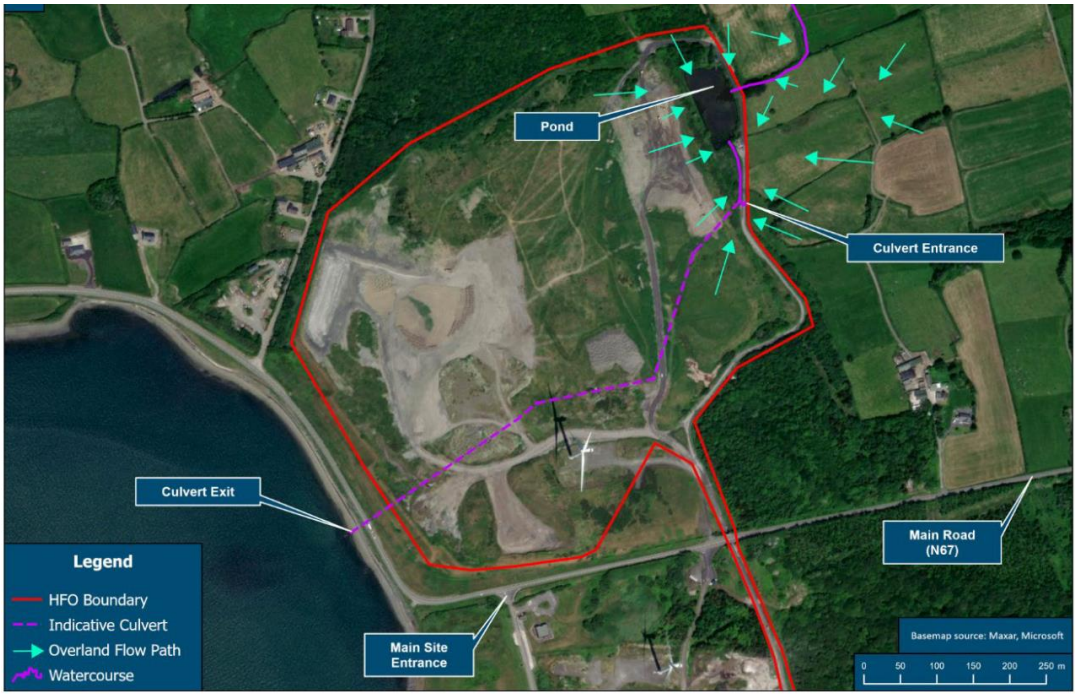
Emission point	Monitored Parameters
SW1, SW14, SW15	pH, conductivity, COD, TOC, suspended solids, total nitrogen, orthophosphate, chloride, sulphate, toxicity, metals (including Cr and Cd)
SW2, SW5, SW6	Conductivity, pH, ammonia, suspended solids, oils
SW3, SW10	BOD, suspended solids
SW4, SW13	pH, suspended solids, visual inspection, COD
SW4A	Chlorine
SW7	Flow, pH, conductivity, ammonia, suspended solids, chlorine, oils
SW8	Flow, temperature, chlorine
SW9	pH, suspended solids, oils

Source: Extract compiled from Industrial Emission Licence P0605-04, Schedule C.2.1, C.2.2 and C.2.3

11.4.4.1 Existing Culvert

Prior to the development of the Ash Storage Area the Mologha river (Tonavoher_010) was a physical boundary delineating the boundary of the townlands of Carrowdotia North and Ballymacrinan. The river was culverted to allow the development of the Ash Storage Area and its route is illustrated in Figure 11.3 below.

Figure 11.3: Route of culverted Mologha river



Source: Flood Risk Assessment - Moneypoint Security of Supply Project, ESB 2024

11.4.5 Flood Risk

A Flood Risk Assessment (FRA) report of the proposed development site has been prepared by ESB (EIAR Appendix H, Document no. QP-000017-65-R460-002-000). The FRA report was prepared in accordance with the Planning System and Flood Risk Management, Guidelines for Planning Authorities (OPW, 2009), and is included in Appendix H of this EIAR. A desktop review of the published flood mapping available from the Office Public Work (OPW) and Geological Survey Ireland was undertaken to establish previous and current flood risk.

The flood mapping data sources identify only a single past (coastal) flood event, which occurred on 01 January 2014 (Flood ID – 12970), adjacent to the north-western boundary of the Moneypoint Generating Station, along the N67 road. No other past flood events have been recorded in close proximity to the boundary.

11.4.5.1 Existing Fluvial Flood Risk

The FRA reviewed available fluvial flood mapping. National Indicative Fluvial Mapping presents the modelled extents of fluvial flooding during a theoretical flood event with estimated probability occurrences of both 1% and 0.1% in contrast to information based on actual floods which have occurred historically. This data has been produced for catchments greater that 5km^2; however, the Mologha river has a catchment of 3.5km^2, as such, there is no mapped fluvial flood risk within or adjacent to the application site.

11.4.5.2 Existing Coastal Flood Risk

National Coastal Flood Hazard Mapping is an update of the extreme water level estimation undertaken as part of the Irish Coastal Protection Strategy Study (ICPSS) between 2004 and 2013. The 0.1% Annual Exceedance Probability (AEP) coastal flooding event flood levels at Kilrush are predicted to reach 3.58m Ordnance Datum (OD) under the present-day scenario. This is very similar to the equivalent flood level modelled at the National Coastal Extreme Water Level Estimation Point S10 just to the south of Moneypoint (3.57m OD). The Mid-Range Future Scenario (MRFS) and High-End Future Scenario (HEFS) both include for climate change and have predicted sea levels of 4.07m OD and 4.57m OD respectively. Within the Moneypoint Generating Station main complex the proposed finish floor levels are 5.65m OD, which is 1.07m above the HEFS. The only areas which are below the HEFS are the limited existing exposed basement areas to the west of the main generating station building. It is noted that the present day or MRFS do not result in any coastal flooding in the main operational areas of the Moneypoint complex. At the Ash Storage Area, the coastal flood hazard mapping identifies parts of the Ash Storage Area (closest to the coastline) as being below the HEFS flood level; however recent drone topographical surveying has shown that these areas are higher than the HEFS flood levels. Under the proposed changes at the Ash Storage Area the HEFS flood levels will continue to be exceeded.

Figure 11.4: HEFS Coastal Flood Mapping

Source: Flood Risk Assessment - Moneypoint Security of Supply Project, ESB 2024

11.4.5.3 Existing Pluvial Flood Risk

There is no mapped pluvial flood risk within Moneypoint Generating Station complex. The proposed development will substantially increase the impermeable area of the existing site and hence surface water runoff from the site will be increased. The impermeable area around the HFO tanks will increase from 7,450m^2 to 20,770m^2. The new auxiliary boiler building will occupy an area of 432m^2 on ground that is currently free draining.

11.4.5.4 Existing Groundwater Flood Risk

The Geological Survey of Ireland groundwater flood mapping shows that there is no predicted groundwater flooding, how this mapping is relevant to limestone regions. The Moneypoint Generating Station complex is underlain by the Central Clare Group, consisting of sandstone, siltstone & mudstone, with bedrock suspected to be close to the surface in some areas. The available mapping would suggest the proposed development would be unlikely to be impacted by groundwater.

11.4.6 Assessment of Sensitivity of the Receiving Environment

All surface water on site drains to the Lower Shannon Estuary to the south, via one final outfall discharge point. The final outfall point also acts as a sampling point as required under the station's IE Licence. The existing drainage network is subject to three yearly inspection and repair works to maintain their performance as required by the extant IE Licence.

With reference to Table 11.6, it is noted that the Lower Shannon Estuary is categorised as having Good status under the WFD. However, with reference to Table 11.3, the sensitivity of the

Lower Shannon Estuary is Extremely High due to the linkage with the European designated sites - the Lower Shannon Estuary SAC and River Shannon and River Fergus Estuaries SPA. The Mologha (Tonavoher_10) river waterbody is at Moderate status, and with reference to Table 11.3, the sensitivity of this waterbody is Low due to its short, concealed (culverted) nature and low value on a local scale.

11.5 Likely Significant Impacts

11.5.1 Do Nothing

In a 'Do Nothing' scenario, there would be no immediate impact on the baseline conditions of the proposed site regarding surface water resource and flooding. The existing Moneypoint Generating Station complex is an Industrial Emissions licensed site and will continue to comply with the conditions of the extant IE licence.

11.5.2 Construction Phase

Given the nature of the proposed development (as described in Chapter 4 of this EIAR), the potential for impacts on the water environment are for the most part associated with the construction phase of the proposed development and are similar to any civil engineering project. These include:

- Impacts to surface water quality from sediment runoff, spillages, discharge to receiving waters.
- Impacts on water supply and drainage infrastructure.
- Impacts on flood risk.

11.5.2.1 Surface Water Quality and Drainage

There are no works required to any watercourse, this includes the existing culvert through the Ash Storage Area which diverts the Mologha river. The culvert is below the oldest ash deposits and will not be impacted by the proposed reprofiling works at the Ash Storage Area. The site comprises a gently undulating area, generally sloping towards the Shannon Estuary, of made ground. Rainfall will predominantly soak into the ground or enter the surface water collection points located within the site boundary.

During construction the principal risk arises from heavy rainfall causing surface water runoff which then flows into nearby drains transporting sediment and subsequently may affect nearby surface water bodies.

All construction support related activities including office and welfare facilities will be contained within the established Contractor's compound and laydown areas. Typical temporary site services such as power, sewage and potable water shall be readily available to the Contractor's compound and laydown area.

During construction, incident rainfall will continue to soak into the ground. The new surface water drainage system will be progressively constructed and connected to the existing site-wide drainage network. As elements of the construction that will intercept rainfall (hard surfaces and roofs) are constructed these will be connected to the site drainage system.

The receiving waterbody is considered to be of international importance and of Extremely High sensitivity given its designation as a SAC/SPA. Pollutants mobilised by incident rainfall and migrating with surface water runoff could enter Lower Shannon Estuary to the south of the site. Potentially polluting activities will however be controlled to prevent spillages of polluting materials.

During construction there is a potential for silt to run-off exposed surfaces. High risk activities such as pouring concrete and refuelling vehicles will also have the potential to cause polluted runoff which may enter unprotected drains. Polluting matter entering drains has the potential to discharge to Lower Shannon Estuary in the south. The magnitude of any such pollution incidents is likely to be moderate/large, presenting a significant profound adverse impact of temporary duration on the Lower Shannon Estuary SAC/SPA prior to implementation of mitigation measures.

It is not anticipated that any excavations will require dewatering. A negligible magnitude of impact is assessed resulting in an imperceptible effect.

A number of chemicals will be stored and used on site during the construction phase including fuel and oil. In the absence of control measures in place, should these contaminants enter the water environment through accidental spillages, they have the potential to adversely impact on the water quality in the receptor water body (Lower Shannon Estuary).

The proposed dismantling works in the coalyard are above-ground works and the drainage will be left in place. The drainage will be protected from damage, sedimentation and contamination during these works.

Therefore, significant short-term adverse impacts on surface water quality could result from the construction phase of the proposed development.

11.5.2.2 Water Supply and Drainage Infrastructure

The Contractor's temporary construction compound will be located along the western boundary within the existing operational compound. Typical temporary site services such as power and potable water are readily available in this area and will be brought to the contractor's compound. Existing toilet and washing facilities are located at the established contractor laydown area. Additional toilet and welfare facilities are located across the site, and available for contractors. Foul waste can be discharged into the local foul drainage system or regularly disposed off-site using appropriate facilities. A suitably bunded generator may also be used for power if preferred. A temporary disruption to services may be required to facilitate connection to the network.

Overall, a negligible magnitude of impact is assessed resulting in an imperceptible effect.

11.5.2.3 Flood Risk

The FRA has concluded that there is no significant fluvial, groundwater or pluvial flood risk at the site. There is a residual risk of the blockage of culvert (diverted Mologha river) to the immediate east of the Ash Storage Area. However, if such an event was to occur it would not pose a risk to any infrastructure inside or outside the site application boundary due to local topography, as potential floodwaters would be restricted to low-lying fields. The culvert has no history of blockages and is subject to an inspection and maintenance regime. It is important to note that there are no proposed works to the culvert to facilitate the proposed development.

Due to the existing topography at the Moneypoint Generating Station complex there are no construction areas which will be impacted in the event that High End Future Scenario coastal flood levels occurred.

The impact of construction on all types of flooding is deemed to be imperceptible.

11.5.3 Operation and Maintenance Phase

11.5.3.1 Water Supply

There is an extensive water supply network serving the main power station. Water supply will be required for the proposed auxiliary boiler house. This will be provided via the existing supply to the adjacent main power station complex. Water usage for the Moneypoint Generating Station is expected to reduce over time as energy generation by coal is phased out.

Overall, a negligible magnitude of impact is assessed resulting in an imperceptible effect.

11.5.3.2 Potable Water

The retention of the potable water supply currently supplying the Moneypoint Generating Station will be required for the existing welfare facilities available to the site. The estimated volume of water required to accommodate the welfare facilities will remain at existing rates. Water demand will typically be limited to domestic water consumption for staff welfare.

A negligible magnitude of impact is assessed resulting in an imperceptible effect due to the limited volume of water required.

11.5.3.3 Surface Water Runoff/ Drainage

During the operational phase of the proposed development, runoff from the proposed HFO bunds will be treated to remove sediments and pollutants prior to discharge from site as it does currently. A glass-reinforced plastic Class 1 full retention oil separator is regularly serviced by the station's waste management provider. The interceptor is 17m^3 internal volume of closed cylindrical shape, 2.4m diameter and 3.6m in length. It has upstream and downstream sluice valves on 225mm diameter pipework. It operates as a Class 1 coalescing filter interceptor with automatic closing operated via two floats contained within 300mm diameter filter housing. The full flow passing through the unit passes two double-sleeved foam filter socks approx. 600mm length with a 300mm internal diameter. These filter socks prevent sludge and solids from entering the outlet chamber which sits on the bottom of the interceptor. From here the treated surface water is discharged by gravity to the final outfall point on the Shannon estuary. The final outfall point also acts as a sampling point as required under the extant IE Licence. The existing drainage network will otherwise remain and is subject to three-yearly testing and repair works to maintain their performance as required by the IE Licence.

Operational impacts in terms of water quality due to surface water runoff discharges will be imperceptible. This proposed approach will ensure operational water pollution controls do not affect transitional waters adjacent to the site. As noted previously the proposed development is located within the boundary of an existing IE licenced facility: the Moneypoint Generating Station (Register Number: P0605-04), regulated by the EPA. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to regularise the proposed development under the IE licence. Public notification was issued in the Irish Times on the 08 January 2024.

The effects of drainage on surface water resources are considered to be negligible and imperceptible.

11.5.3.4 Foul Water

There are no foul water proposals required as part of this development. Existing foul water provision within the existing site boundary of the Moneypoint Generating Station will remain the same.

Operational impacts in terms of foul water discharges will be negligible and imperceptible.

11.5.3.5 Process Wastewater

The only process water effluent released from the proposed development will be via the boiler blowdown vessel at the proposed auxiliary boiler house. Boiler blowdown is water intentionally wasted from a boiler to avoid concentration of impurities during continuing evaporation of steam. This effluent discharge will be controlled such that the overall discharge to the Shannon Estuary at SW2 will not exceed the flow limits of 25 m^3/hour or 400 m^3/day. In addition to this, the current emission limit values associated with discharge at SW2 will continue to be complied with (i.e. pH, mineral oil, suspended solids and Ammonia (as N)).

The effects of process wastewater on surface water resources are considered to be negligible and imperceptible.

11.5.3.6 Oil Spillage from Tankers

Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. The risk from accidental spillage of HFO from shipping vessels in transit, or during the unloading is considered highly unlikely. Also, HFO is highly viscus and it must be heated in order to pump or pour it as it solidifies once cooled and is therefore less mobile.

HFO ships are generally much smaller than the average coal ship. It takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship.

A “procedure for unloading oil ships”, shore side check list for ship unloading and “Oil Spill Response Plan” is in place on site which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills. There is also a spill containment area to capture any spills that might occur at the unloading arm.

Moneypoint is a member of the Shannon Estuary Anti-Pollution Team (SEA-PT). The group consists of the Port Company, Local Authorities, Offshore Industry and Oil Importers and was initiated to form a unified coordinated response to pollution incidents on the Shannon Estuary. Emergency response exercises are conducted periodically with SEA-PT and Moneypoint also periodically do their own emergency response exercises.

The receiving waterbody is considered to be of Extremely High sensitivity. In an unlikely event of oil spill in the Lower Shannon Estuary there will be potential temporary to permanent significant adverse effect to the water quality in the absence of mitigation (also refer to Chapter 10).

11.5.3.7 Flood Risk

The FRA report (EIAR Appendix H, Document no. QP-000017-65-R460-002-000) concludes that the proposed development will not increase the current flood risk in the catchment and that there is no significant risk of flooding to the proposed development, or other development or infrastructure outside the application site based on the assessment undertaken.

The freeboard provided to new buildings coupled with the existing topography exceeds the ‘worst case’ predicted coastal flood levels (HEFS of 4.57m OD) by 1.07m, therefore there is no significant risk from coastal flooding or any other flood risk type (fluvial, pluvial, groundwater).

The impacts during the operational and maintenance phase on all types of flooding is deemed to be imperceptible.

11.5.4 Decommissioning Phase

The proposed development is expected to be operational until end of 2029. On cessation of activities the plant will be decommissioned, in line with the requirements of the planning permission and IE licences, unless otherwise authorised. The activities associated with the decommissioning phase will be similar to those associated with the construction phase.

Therefore, provided that appropriate mitigation is used, the impacts of the decommissioning phase should be, as a worst-case scenario, similar to those at construction phase.

11.6 Cumulative Effects

Cumulative effects may occur in the event that works in the vicinity of the same watercourse occur concurrently or immediately subsequently. Before the commencement of construction and during the construction phase, engagement with the proponents of other developments (refer to Section 5.5.9 of this EIAR) will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts on water are mitigated and minimised.

Following the implementation of mitigation measures detailed in this EIAR and the measures to be implemented by other projects, significant adverse effects are not likely to occur.

11.7 Mitigation and Monitoring Measures

Construction activities have the potential to create a hazard to the water environment. All work will be carried out having regard to international and national legislation, and best practice guidance, as detailed in the topic specific chapters of this EIAR.

A Construction Environmental Management Plan (CEMP) is included in Appendix C of this EIAR. The CEMP will be implemented during the construction phase to safeguard the environment, site personnel, and nearby receptors, i.e. occupiers of residential and commercial properties, from site activities which may cause harm or nuisance.

11.7.1 Construction Phase

In addition to mitigation and monitoring measures below, refer to measures listed in Section 10.8.1.6 in Chapter 10 Biodiversity.

- An Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
- Construction activities will be managed to prevent impacts to surface waters:
  - Concrete wash water will be retained temporarily on site, and prevented from entering the drainage network. The temporary storage will be in place until the management of the wash water (either treatment or disposal) is agreed, in accordance with the best practice and the CEMP.
  - Refuelling will be undertaken using purpose designed equipment bunded to prevent leaks. Should any fuels or other liquids spill or leak from any vehicles these will be cleaned immediately, and any affected soils excavated and removed.
  - Excavations for service runs will be managed using control measures such as bunding areas to prevent surface runoff and protecting drains.
- All construction works will be carried out in accordance with the CEMP included in Appendix C of this EIAR which defines the measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water drainage system.

- Wet concrete operations adjacent to watercourses will be avoided where possible.
- Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite and remote from watercourses.
- Where works on other projects in vicinity of proposed development occur in parallel appropriate mitigation measures, within the parameters assessed in this EIAR (including the scheduling of works and regular liaison meetings between project teams) will be implemented to ensure that plans are co-ordinated, and impacts are minimised.
- All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for 'Environmental Good Practice on Site' (C741) and 'Control of water pollution from linear construction projects. Technical guidance' (C648) and the IEL.
- In order to reduce the risk of contamination arising as a result of spills or leakages on land, measures including, but not limited to, the following will be employed.
  - All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations.
  - In accordance with Condition 8.4 of the IEL, waste and materials shall be stored in designated areas, protected as may be appropriate against spillage and leachate run-off. The waste and materials shall be clearly labelled and appropriately segregated.
  - Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces or using mobile drip trays where it's not possible to provide an impermeable surface;
  - All tanks and drums will be bunded in accordance with established best practice guidelines; and
  - Spill kits will be provided at all compound locations and carried by all crews during excavation works.

Sediment control in the construction stage is important to ensure that only high quality, treated runoff leaves the site. Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments will be provided for on-site if required during the construction stage. Erosion control measures include:

- Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction.
- Monitoring of the weather forecast prior to planning excavation works.

Other drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided adjacent to excavations and installed before starting site clearance and earthworks if deemed necessary by the supervising Engineer.

11.7.2 Operation and Maintenance Phase

The proposed development will operate in accordance with the limits for wastewater discharge set by the EPA under the IE licencing regime.

The existing water quality monitoring programme will continue and the parameters, thresholds and frequency, as set by the EPA, will be complied with.

In the event of an accidental oil spill, the ESB Moneypoint Oil Spill Response Plan will be implemented which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills. The measures to prevent and mitigate oil spill during unloading in the estuary are discussed in Section 10.8.

During the transit of the HFO vessels within the Lower River Shannon Estuary ESB will ensure that all oil tankers shipping the HFO will have regard the International Safety Guide for Oil

Tankers and Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS). In addition, the recommendations of the International Maritime Organisation will be reviewed and implemented, as necessary.

Further recommendations regarding the ensuring of surface water protection on site and of the Lower River Shannon SAC during the construction and operational phases of the proposed development include the following:

- Avoid the interruption and diversion of natural water flow paths;
- Monitor any changes to the thermal environment of the River Shannon and fish entrainment;
- Avoid the pollution of water which enters the construction phase and operational drainage systems, including through the maintenance of any settlement ponds and monitoring of silt traps; and
- Continually monitor the impact on watercourses within the site and rectify any damage to the aquatic environment with the appropriate authorities.

11.7.3 Decommissioning Phase

The proposed development will be decommissioned post 2029 in accordance with the Decommissioning Management Plan (DMP), under the conditions of the extant IE licence (Register no. P0605-04).

In accordance with the extant IE licence the DMP will be reviewed on an annual basis and updated as necessary.

All demolition/decommissioning activities will be managed through the CEMP, prepared for the decommissioning phase. Should dewatering be required this will be managed under a method statement to prevent silty water discharging to drains or surface water receptors.

11.8 Residual Impacts

The implementation of the measures detailed in this EIAR will ensure that the impact of the proposed development on surface water resources will be imperceptible.

Considering the control measures to prevent polluting substances entering the surface water and subsequently migrating to the Lower Shannon Estuary transitional body located adjacent to the site, the effects on surface water and drainage are considered to be negligible resulting in an imperceptible effect.

Moneypoint Generating Station is a licensed facility under the IE licensing regime, as regulated by the EPA. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to regularise include the proposed development under the IE licence.

With the implementation of the mitigation measures proposed, the proposed development will not result in a change in status of any surface water WFD quality elements or prevent any surface water waterbodies from reaching good status in the future.

12 Land, Soils and Hydrogeology

12.1 Introduction

This chapter of the EIAR presents an assessment of the potential significant impacts posed by the continued power generation by, and redevelopment of, Moneypoint Generating Station, based on the full outline design as described in Chapter 4 – Description of the Proposed Development.

The current assessment addresses the potential impacts and post-mitigation residual effects (covering both construction and operational phases) on a series of sensitive receptors identified for Land Use, Soils and Geology, and Hydrogeology. This chapter should be read in conjunction with the following chapters, and their appendices, which present related impacts arising from the proposed project and proposed mitigation measures:

- Chapter 6 – Population and Human Health
- Chapter 9 – Biodiversity
- Chapter 10 – Surface Water Resources and Flooding
- Chapter 16 – Material Assets and Waste Management

A specific Water Framework Directive (WFD) screening has been conducted for WFD groundwater bodies intersected by the proposed development working areas, to assess the impact of the proposed construction activities on their status and to WFD objectives.

Proposed environmental control measures and additional mitigation measures to prevent, reduce and/or offset the anticipated potential impacts are presented as appropriate.

12.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Land, Soils and Hydrogeology chapter are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

12.2.1 Polices

This chapter has been prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the ‘EIA Directive’) as amended by Directive 2014/52/EU (European Commission, 2014).

The requirements of the following legislation have also been complied with:

- The Water Framework Directive (WFD) 2000/60/EC (European Commission, 2000) provides a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. The Directive requires Member States to establish river basin districts and, for each district, a river basin management plan (RBMP) which is revised, implemented and reviewed every six years. The Groundwater Daughter Directive 2006/118/EC (European Commission, 2006) establishes a regime which sets groundwater quality standards and introduces measures to prevent or limit the input of pollutants into groundwater and was amended by Directive 2014/80/EU (European Commission, 2014). The WFD was implemented in Ireland by Statutory Instrument (S.I.)

722/2003 (Office of the Attorney General, 2003). Objectives for protection of groundwater against pollution and deterioration were implemented in S.I. 9/2010 (Office of the Attorney General, 2010).

- EU Directive 80/68/EEC (European Commission, 1979), amended by the Priority Substances Directive 2013/39/EU (European Commission, 2013), concerns the collection, treatment and discharge of urban wastewater and the treatment and discharge of waste water from certain industrial sectors. The objective of the Directive is to protect the environment from the adverse effects of these wastewater discharges and is implemented in Ireland as S.I. No. 684/2007 (Office of the Attorney General, 2007).
- The Drinking Water Directive 98/93/EC (European Commission, 1998), amended by Directive 2020/2184 (European Commission, 2020) concerns water quality for human consumption, and is implemented in Ireland as S.I. No. 122/2014 (Office of the Attorney General, 2014). Thresholds for potable groundwater quality indicators are specified in S.I. No. 366/2016 (Office of the Attorney General, 2016).
- The Waste Framework Directive 2008/98/EC (European Commission, 2008) provides waste management principles for the protection of water, soils and places of special interest, and establishes an order of preference for managing and disposing of waste.

Geology is recognised as an important component of natural heritage in three separate pieces of national legislation which include the following:

- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001(as amended)
- Wildlife (Amendment) Act 2000

This legislation requires various branches of Government and statutory agencies to consult and take due regard for potential conservation of geological heritage features. Any geological features within the red line boundary (RLB) that are considered valuable and worthy of protection, these features would be classified as Geological Heritage Sites and County Geological Sites, which may be viewed online[147].

12.2.2 Guidelines

The assessment was carried out with reference to the following guidance and adapted to reflect the nature of the proposed development and attributes of the receiving environment based on professional judgement and experience:

- Guideline for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (Institute of Geologists of Ireland, 2013).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports. Environmental Protection Agency (Environmental Protection Agency, 2022).
- Guidelines on the Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Road Authority, 2009) (now Transport Infrastructure Ireland (TII))
- Planning for Watercourses in the Urban Environment: A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (Inland Fisheries Ireland, 2020).
- Control of Water Pollution from Construction Sites - Guide to Good Practice (C532) (CIRIA, 2001).

[147]Geological Survey Ireland (2023) Geological Heritage Geological Heritage (arcgis.com)

- Methodology for establishing groundwater threshold values and the assessment of chemical and quantitative status of groundwater, including an assessment of pollution trends and trend reversal. Wexford: Environmental Protection Agency (Craig & Daly, 2010).

12.3 Methodology

12.3.1 Assessment Scope

The main scope of this assessment consists of the analysis of potential impacts posed by the proposed development works (considering both construction and operational phase) on hydrogeological and geological elements and to provide indications for adequate mitigation measures where required.

The assessment follows a staged approach methodology involving:

1. Acquisition of construction works details for each working area under investigation, based on information summarised in Chapter 4, to establish the location, type and scale of required works and activities. This includes (but is not limited to) consideration of elements such as earthworks, storage / transmission of leachable or hazardous materials, lowering of groundwater levels by pumping or drainage, discharges to ground and penetrative works above or below water table.
2. Establishing the baseline conditions and **sensitivity** of potential receiving environments in respect to the soil, geological and hydrogeological elements for each working area within the flood relief scheme.
3. Quantifying the **magnitude of impacts** and the **significance of associated effects** on the identified receptors.
4. Identifying relevant **mitigation measures** to apply and determine **residual effects**.

The impact assessment methodology is based on the guidance listed in Section 12.2 and professional judgement and experience. The approach used for each stage of the current assessment is discussed in detail in the sections below.

12.3.2 Approach to Data Collection

A desktop study was undertaken to review the existing accessible data, in addition to assessments carried out to date. From this data, outlined in Table 12.1, constraints and likely sensitive receptors have been identified.

Table 12.1: Data sources used to inform the land, soils and hydrogeology chapter of this EIAR

Data Source	Date	Data Content
AECOM Ireland Limited 2022 ESB Moneypoint Generating Station IEL Support – 2022 Groundwater Data Review. Report Reference: 60673488-ACM-RP-EN-001	2022	Groundwater monitoring data, summary and analysis
ESB 2018 Moneypoint Oil Tank Bunds – Re-appraisal of Fitness-For-Purpose. Report Reference: QS-000130-69-R485-001	2018	Moneypoint infrastructure review and analysis
Soil Mechanics Limited (1979) ESB Power Station, Site Investigation Report	1979	Ground Investigation report including borehole logs and ground conditions prior to construction of power station

Data Source	Date	Data Content
Golder Associated Ireland Limited (2021) ESB Moneypoint Generating Station – Environmental Site Assessment and Quantitative Risk Assessment	2021	Impacts of historical HFO spill at Moneypoint Generating Station to soils, geological and hydrogeological receptors
Land and Land Use		
CORINE Land Cover (Corine, 2018)	2018	Corine Land Use
Soils and Geology		
Geological Survey of Ireland (GSI) Web Map Viewer (Geological Survey of Ireland, 2023)	2023	• Superficial Deposits (scale 1:50,000); • Bedrock Geology (scale 1:100,000); • Borehole Logs; and • Geohazards include landslide susceptibility.
EPA database (Environmental Protection Agency, 2022)	2023	• SIS National Soils; • Special Areas of Conservation (SACs); • Special Protection Areas (SPAs); and • National Heritage Areas (NHA).
Hydrogeology		
GSI Web Map Viewer (Geological Survey of Ireland, 2023)	2023	• Groundwater Bodies; • Karst features including caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs; • Karst traced underground connections; • Groundwater Resource Potential; • Groundwater Vulnerability; • Wells and Springs; • Group Scheme and Public Supply Source; • Protection Areas; and • Superficial Deposit Permeability.
EPA Maps (Environmental Protection Agency, 2023)	2023	• National Water Monitoring Stations; • Hydrometric Gauges; • WFD Waterbodies (Groundwater, Lake, River, Coastal and Transitional) and status; and • WFD Catchments and Sub catchments.
EPA Water Quality in Ireland 2016-2021 (Environmental Protection Agency, 2021)	2021	• Factors Determining WFD Status; and • Nutrients and Trends.
Contaminated Land		
EPA Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites	2013	• Risk Assessment Methodology

12.3.3 Approach to Impact Assessment

12.3.3.1 Identification of Receptors

The scope used to identify the various baseline receptors in proximity to the proposed development are summarised in Table 12.2.

Table 12.2: Summary of key receptors to be considered

Environmental Elements	Key Receptor
Land and Land Use	• Land use types and potential contaminants
Soils and Geology	• Soils, superficial deposits, bedrock geology and other geological features, further to a review of GSI data and site specific ground investigation. • Mapped karst landforms including caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs. • Geological heritage sites. • Geohazards: recorded events, primarily landslides, karst features. • Economic geological sites.
Hydrogeology	• Groundwater body and both quantitative and qualitative status classification as assigned under the WFD. • Groundwater: Groundwater abstractions from Public Supply Schemes, Group Water Schemes and local domestic/agricultural wells (with varying degrees of location accuracy) mapped by the GSI including Source Protection Zones (SPZs). • Traced underground connections of known water dye trace studies. • Groundwater discharges. • Groundwater Drinking Water Protection Areas. • Aquifer Type, as assigned by the GSI; relates to the aquifers productivity in terms of well yields as detailed below: – Ll – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones – Lm – Bedrock which is Generally Moderately Productive – Lk – Locally Important Aquifer – Karstified to a limited degree or area – Rkd – Regionally Important Aquifer–Karstified (diffuse) – Lg – Locally Important Aquifer– Sand and gravel • Aquifer Vulnerability. • Designated sites that are hydrologically or hydrogeologically connected to the proposed development (e.g. by way of karst connections, or by linear features such as water courses). • Boreholes
Water Quality	All of the above under hydrogeology

Source: (National Road Authority, 2009)

12.3.3.2 Assessment of Receptor Sensitivity

A receptor is defined as an element potentially subjected to an impact by the proposed construction activities. The sensitivity (also referred as “importance” in National Road Authority (NRA) guidelines) of geological or hydrogeological receptors should be assessed on the basis of their quality, extent (scale) and rarity. Typical criteria to be applied in assessing the importance of these elements are provided by NRA - *Guidelines on the Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (National Road Authority, 2009) hereafter referred to as the NRA Guidelines, and EPA - *Guidance on the Information to be contained in Environmental Impact Assessment Reports* (Environmental Protection Agency, 2022), hereafter referred to as the EPA Guidelines 2022, as set out in Table 12.3 and Table 12.4.

Quantitative guidance regarding the importance/sensitivity for land use receptors is not addressed in the NRA methodology in the NRA Guidelines. As such, professional judgement has been used to assign receptor values based on the perceived ecological, economic and societal value of land use types.

Table 12.3: Estimation of Sensitivity/Importance of Land, Soil and Hydrogeology Receptors

Sensitivity/Importance	Criteria	Example
Very High	● Attribute has a high quality, significance, or value on a regional or national scale. ● Degree or extent of soil contamination is significant on a national or regional scale. ● Volume of peat and / or soft organic soil underlying route is significant on a national or regional scale.	● Geological feature rare on a regional or national scale such as National Heritage Areas (NHA). ● Large existing quarry or pit. ● Proven economically extractable mineral resource.
High	● Attribute has a high quality, significance, or value on a local scale. ● Degree or extent of soil contamination is significant on a local scale. ● Volume of peat and/or soft organic soil underlying site is significant on a local scale.	● Contaminated soil on site with previous heavy industrial usage. ● Large recent landfill site for mixed wastes. ● Geologically feature of high value on a local scale (County Geological Site). ● Well drained and/or high fertility soils. ● Moderately sized existing quarry or pit. ● Marginally economic extractable mineral resource.
Medium	● Attribute has a medium quality, significance, or value on a local scale. ● Degree or extent of soil contamination is moderate on a local scale. ● Volume of peat and / or soft organic soil underlying site is moderate on a local scale.	● Contaminated soil on site with previous light industrial usage. ● Small recent landfill site for mixed wastes. ● Moderately drained and / or moderate fertility soils. ● Small existing quarry or pit. ● Sub-economic extractable mineral resource.
Low	● Attribute has a low quality, significance, or value on a local scale. ● Degree or extent of soil contamination is minor on a local scale. ● Volume of peat and / or soft organic soil underlying site is small on a local scale.	● Large historical and / or recent site for construction and demolition wastes. ● Small historical and / or recent site for construction and demolition wastes. ● Poorly drained and / or low fertility soils. ● Uneconomically extractable mineral resource.

Source: (National Road Authority, 2009).

Table 12.4: Estimation of Sensitivity/Importance of Hydrogeology attributes

Sensitivity/Importance	Criteria	Example
Extremely High	● Attribute has a high quality or value on an international scale.	● Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g., Special Areas of Conservation (SAC) or Special Protection Areas (SPA) status.
Very High	● Attribute has a high quality or value on a regional or national scale.	● Regionally Important Aquifer with multiple wellfields. ● Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. ● Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	● Attribute has a high quality or value on a local scale.	● Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers. ● Locally important potable water source supplying >1000 homes. ● Outer source protection area for regionally important water source. ● Inner source protection area for locally important water source.
Medium	● Attribute has a medium quality or value on a local scale.	● Locally Important Aquifer. ● Potable water source supplying >50 homes. ● Outer source protection area for locally important water source.
Low	● Attribute has a low quality or value on a local scale.	● Poor Bedrock Aquifer Potable water source supplying <50 homes.

Source: (National Road Authority, 2009)

12.3.3.3 Assessment of Magnitude of Impact

The significance of any potential impact has been determined based on the sensitivity of the feature to be protected and the magnitude of the impact on the receiving geological/ hydrogeological environments. The terms used to define magnitude of impact, are in accordance with the NRA Guidelines and in line with the concepts provided by the EPA Guidelines 2022. A classification of these attributes is provided in Table 12.5.

The NRA Guidelines state that impacts associated with construction of new developments are not necessarily always negative and that positive impacts are sometimes possible (e.g., enhancement of geological exposures, reduction in serious pollution risk to surface waters). Impacts should, therefore, be identified as positive, neutral or negative. Impacts may further be categorised according to type; they may be “direct”, or “indirect”, or in the case of a negligible/neutral impact have “no predicted impact”.

The assessment of the impact of the proposed development on identified receptors will also include the duration of relative effect: temporary or permanent.

Table 12.5: Criteria for Rating Impact Significance

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
Large Adverse (Negative) – Direct – Indirect	● Results in loss of attribute and / or quality and integrity of attribute. ●	● Removal of large proportion of aquifer. ● Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. ● Potential high risk of pollution to groundwater from routine run-off. ● Calculated risk of serious pollution incident >2% annually.	● Loss of high proportion of future quarry or pit reserves. ● Irreversible loss of high proportion of local high fertility soils. ● Removal of entirety of geological heritage feature. ● Requirement to excavate / remediate entire waste site. ● Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Moderate Adverse (Negative) – Direct – Indirect	● Results in impact on integrity of attribute or loss of part of attribute. ●	● Removal of moderate proportion of aquifer. ● Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. ● Potential medium risk of pollution to groundwater from routine run-off. ● Calculated risk of serious pollution incident >1% annually.	● Loss of moderate proportion of future quarry or pit reserves. ● Removal of part of geological heritage feature. ● Irreversible loss of moderate proportion of local high fertility soils. ● Requirement to excavate / remediate significant proportion of waste site. ● Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Small Adverse (Negative) – Direct – Indirect	● Results in minor impact on integrity of attribute or loss of small part of attribute. ●	● Removal of small proportion of aquifer. ● Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems.	● Loss of small proportion of future quarry or pit reserves. ● Removal of small part of geological heritage feature. ● Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils.

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
		• Potential low risk of pollution to groundwater from routine run-off • Calculated risk of serious pollution incident >0.5% annually.	• Requirement to excavate / remediate small proportion of waste site. • Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Negligible (Neutral) – No predicted impact	• Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	• Calculated risk of serious pollution incident <0.5% annually.	• No measurable changes in attributes.
Minor Beneficial (Positive) – Direct – Indirect	• Results in minor improvement of attribute quality	• Not specified	• Minor enhancement of geological heritage feature. • Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial (Positive) – Direct – Indirect	• Results in moderate improvement of attribute quality	• Not specified	• Moderate enhancement of geological heritage feature. • Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial (Positive) – Direct – Indirect	• Results in major improvement of attribute quality	• Not specified	• Major enhancement of geological heritage feature. • Calculated reduction in pollution risk of 75% or more where existing risk is >1% annually.

Source: (National Road Authority, 2009).

12.3.3.4 Assessment of Significance of Effect

The significance of an impact and its effect should be determined based on the sensitivity of the potential receptor (Table 12.3 and Table 12.4) and the magnitude of impact considered (Table 12.5). The matrix to determine the significance of an effect is provided in the following (Table 12.6).

Table 12.6: Significance of an effect matrix

		Magnitude of Impact			
		Negligible	**Small**	**Moderate**	**Large**
Sensitivity of Receptor	**Extremely High**	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Moderate/ Significant	Significant/ Profound	Profound
	High	Imperceptible	Slight/ Moderate	Moderate/ Significant	Significant/ Profound
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

Source: (National Road Authority, 2009)

12.3.3.5 WFD Assessment Methodology

A baseline WFD screening assessment has been conducted against WFD status for the one groundwater body intersected by the proposed construction. This will determine whether the physical works requires a further assessment to be compliant with the WFD. Further assessment may be required if the proposed works are significantly altered in the future.

12.3.4 Study Area

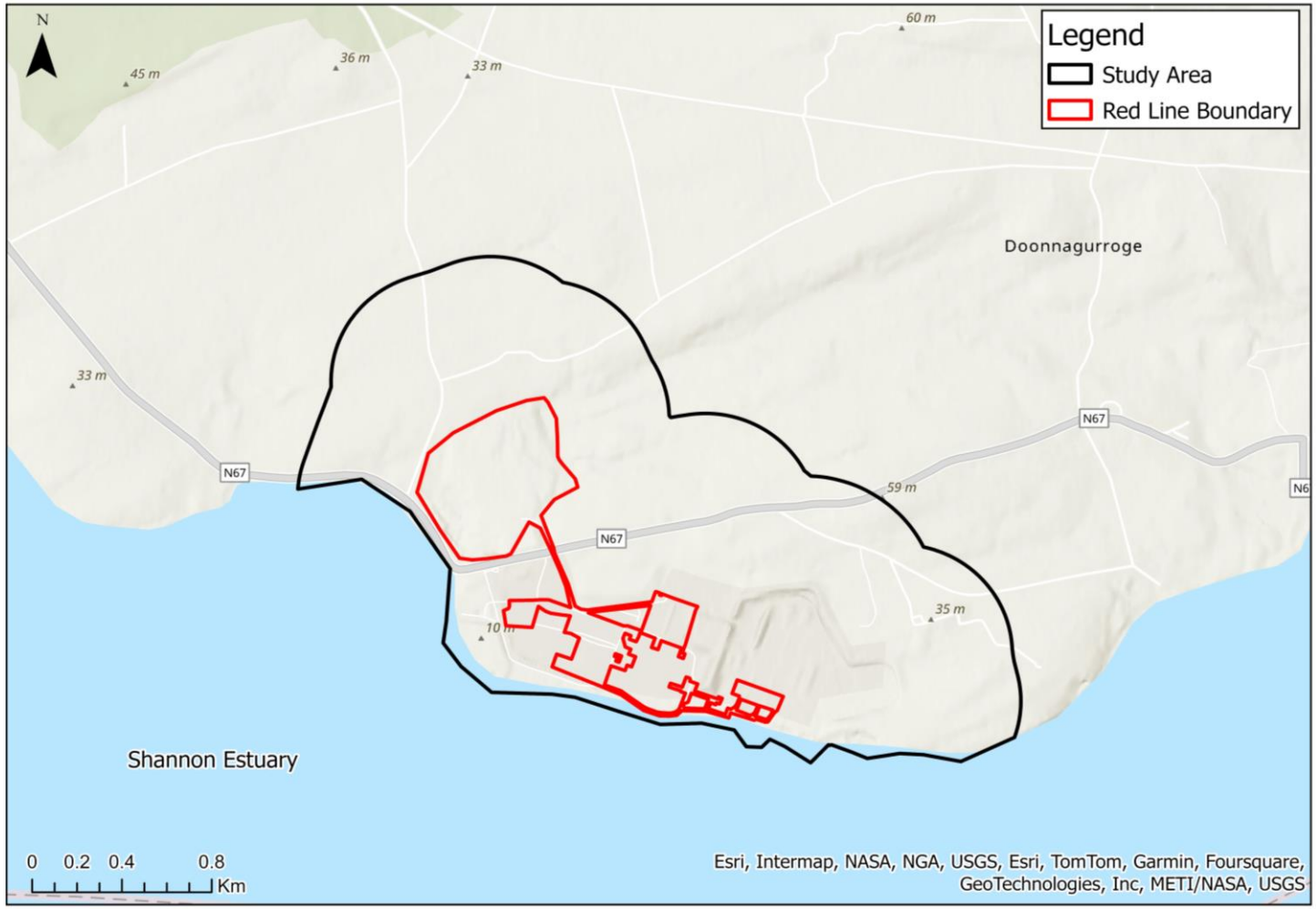
The study area comprises the land required for the continued generation and associated change of fuel type used (ie from coal to HFO) of Moneypoint Generating Station. This will consist of the transition and conversion of the existing coal fired power station's primary fuel to Heavy Fuel Oil (HFO). This includes any construction compounds and temporary access routes and a 500m buffer around these.

Moneypoint Generating Station lies on the northern shore of the [Lower] Shannon Estuary, in the townlands of Carrowdotia North, Carrowdotia South and Ballymacrinan, County Clare, and is located approximately 4km southeast from Kilrush, the nearest town, and approximately 1.8km west of Killimer (see Figure 12.1).

The 500m buffer has been informed considering the design of the proposed development and the potential for external receptors to be impacted via groundwater pathways. The proposed development is close to the River Shannon estuary and shallow groundwater in the coastal zone is likely to be influenced by seawater ingress during high tides. Hence, the zone of influence for consideration of contaminant migration via groundwater is considered to extend from the Moneypoint site to the River Shannon estuary.

The southern boundary of the study area is an INFOMAR priority area and biologically sensitive area (INFOMAR Interactive Maps, 2023).

Figure 12.1: Study Area defined for the Moneypoint Generating Station



Source: Mott MacDonald, 2023

12.3.5 Limitations of this EIAR

- The sources of information used in the assessment are listed in Table 12.1.
- Information sources include third party data and publicly available information. Mott MacDonald have not validated nor warrant the information presented in these third-party reports. These sources of information are assumed to be accurate for the purposes of this report.
- The report is based on outline design presented in Chapter 4 at the current level of available information.
- Any findings presented in this report should be re-evaluated if additional information is presented through additional investigation or design information.

12.4 Receiving Environment

The following sections present an overview of the baseline conditions for the receiving environments and associated receptors (following guidelines provided in Section 12.2) within the working areas defined in Chapter 4.

12.4.1 Land and Land Use

The location and extent of land use types can be found in Figure 12.2. In accordance with the Ireland Grid Reference, the central portion of the site lies at an elevation 5-6m above Ordnance Datum (m AOD).

Current land use within the study area, as identified by Corine Land Use mapping (Corine, 2018) is industrial or commercial units, broad-leaved forest, dump sites and pastures.

Industrial or commercial units in the southern and eastern areas of the site are considered to have Low sensitivity. A 0.45km^2 area north of Ballymacrinan, classified as a dump site, is the current Ash Storage Area. This is also considered to have a ‘Low’ sensitivity. Agricultural land, including pastures and broad-leaved forest, are located immediately surrounding the ownership boundary and have a ‘Medium’ sensitivity.

The Moneypoint site is a significant brownfield landbank, long associated with the generation of electricity and associated activities including fuel management, wind energy generation and electrical infrastructure. The study area is set within a rural landscape consisting of pastures interspersed with farmhouses and mixed forests. The nearest town, Kilrush, is located 4km northwest of the site.

Though most of the site has an urban landcover and a ‘Low’ sensitivity, it also needs to be noted that the surface runoff has potential to pollute the Shannon Estuary, discussed in detail in Chapter 11, Surface Water Resources and Flooding.

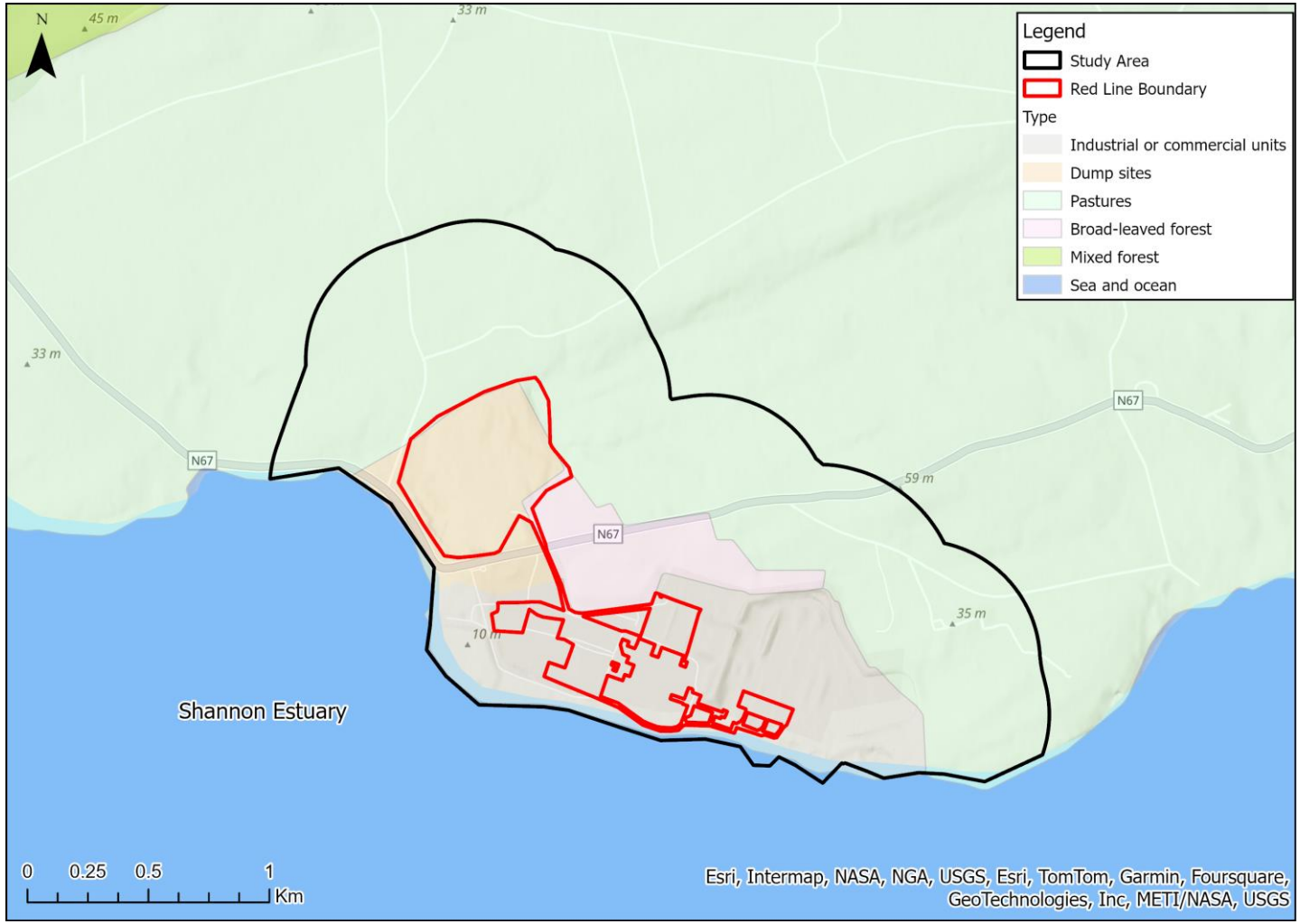
According to historical maps and aerial photography, there were seven quarries in the proposed site and surrounding between 1850’s and 1950’s (Map Genie First Edition, 6-inch maps, that are surveyed between 1829 – 1842). From the past maps, 6-inch and 25-inch (GeoHive Map Viewer, 2023), it is inferred that the site was a greenfield with rural dwellings. There are no recorded maps for the years between 1913 and 1995. The site was acquired by ESB in 1979.

Kilrush flagstone was historically quarried from Flag Slate Quarry (or Moneypoint Quarry) from 1837. The historic quarry was identified within the study using historical mapping available on the OSI website (Ordnance Survey Ireland, 2023). The operational time period of this quarry is unknown.

There are currently no active quarries identified within the study area. The nearest quarry, Derrynalecka Quarry, is located approximately 10km north-east of the Moneypoint Generating Station and produces coal stone and sandstones (Geological Survey of Ireland, 2023).

There are no recorded waste management facilities in the vicinity of Moneypoint Generating Station. The closest dump site boundary is located in the Shannon estuary, approximately 530m south-east of the Moneypoint Generating Station. This inactive dump site (permit number: 348) comprised of dredged material released through the hull of a vessel. Approximately 4.2km to the north-west of the study area, south of Kilrush, there is an active waste dump (permit number: S0020-02) with a permit end date of September 2024. The dump material consists of dredged material and the dumping location is within the Kilrush Marina Approach Channel (Environmental Protection Agency, 2023).

Figure 12.2: Distribution of Land Use across the Study Area



Source: (Corine, 2018)

12.4.2 Soils and Geology

Soils were identified using the Teagasc database (Environmental Protection Agency, Teagasc, Cranfield University, 2014). Superficial deposits and bedrock were identified using the Geological Survey of Ireland database.

12.4.2.1 Soils

Four soil types are identified within the study area including poorly drained, fine, loamy drift with siliceous stones (Kilrush), well drained, loamy, drift with siliceous stones (Ashgrove) and rock[148]. The predominant soil type underlying the majority of the Moneypoint Generating Station is classified as urban. The classification of receptor values for soil type was based on Table 12.3. Soils identified as well drained and/or highly fertile have been classified as high importance value, with the poorly drained and/or low fertility soils classified as low importance value (after National Roads Authority, 2009).

Site investigation works were carried out in November 2021 following the accidental release of heavy fuel oil (HFO) within western portion of the Moneypoint Generating Station at Unit 3 burner sump, in May 2021 (Golder Associates Ireland Ltd, 2022). Although the 2021 site investigation did not cover the entire area of the red line boundary for the proposed development, ground investigations are representative of current conditions across the study area. No site/ground investigations works were carried out for the proposed development. The soil encountered was described as follows:

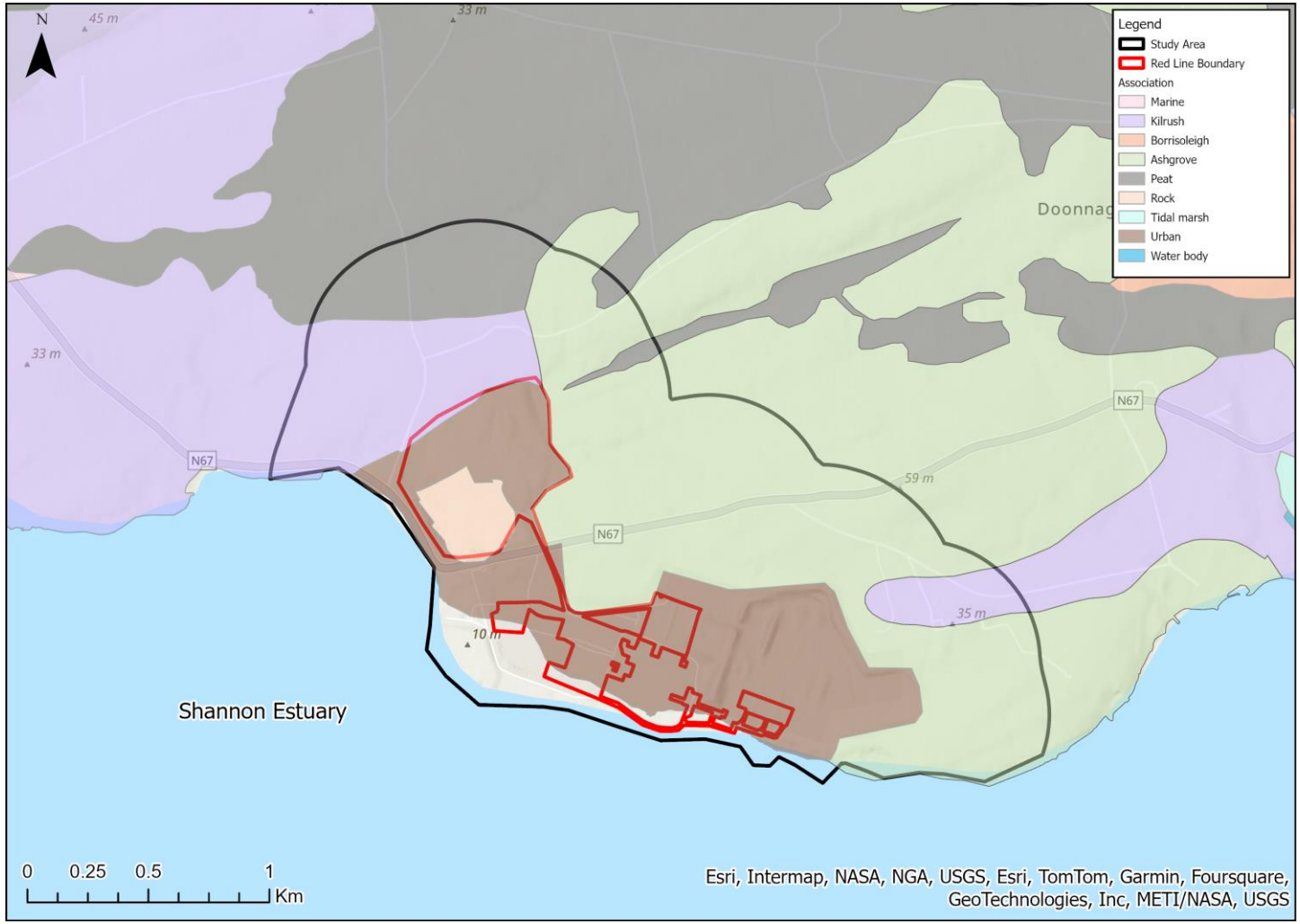
- ‘Made ground comprising tarmacadam or MADE GROUND comprising concrete with rebar’;
- ‘Made ground comprising grey small to very large sub angular gravel’;
- ‘Made ground comprising loose grey to brown sandy silty gravelly cobbles and boulders with mixed debris. Sand is fine to coarse. Gravel is very large and sub angular to sub rounded. Cobbles are very small to very large. Boulders are small to very large’;
- ‘Native ground comprising grey to brown sandy gravelly clayey silt. Fine to medium sand and small to medium gravel’; and
- ‘Native ground comprising light grey to dark grey very fine to medium grained sandstone and siltstone’.

Following the release of Heavy Fuel Oil at the site on 05 May 2021, underlying soils close to the drainage network in the area as well as localised shallow perched water were impacted (Golder Associates Ireland Ltd, 2022). Total Petroleum Hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAH), 2-Methylnapthalene, Dichloromethane (DCM) and Semi-volative Organic Compounds (SVOC) were detected in numerous soil samples acquired from trial pits in the vicinity of the blowdown sump and water drainage infrastructure. Although remediation work was carried out following the HFO spill, residual contamination within the soil is anticipated.

Due to the industrial history of the site and the qualitative assessment that the degree / extent of soil contamination is significant on a local scale, the sensitivity of soil receptors is considered ‘High’ (Table 12.3). Figure 12.3 shows the distribution of soils within the study area and surrounding areas.

[148] Environmental Protection Agency, Teagasc, Cranfield University. (2014). Retrieved from Irish Soil Information System: http://gis.teagasc.ie/soils/map.php (Last accessed 13/07/2023)

Figure 12.3: Soil Types found in the Study Area



Source: (Environmental Protection Agency, 2023)

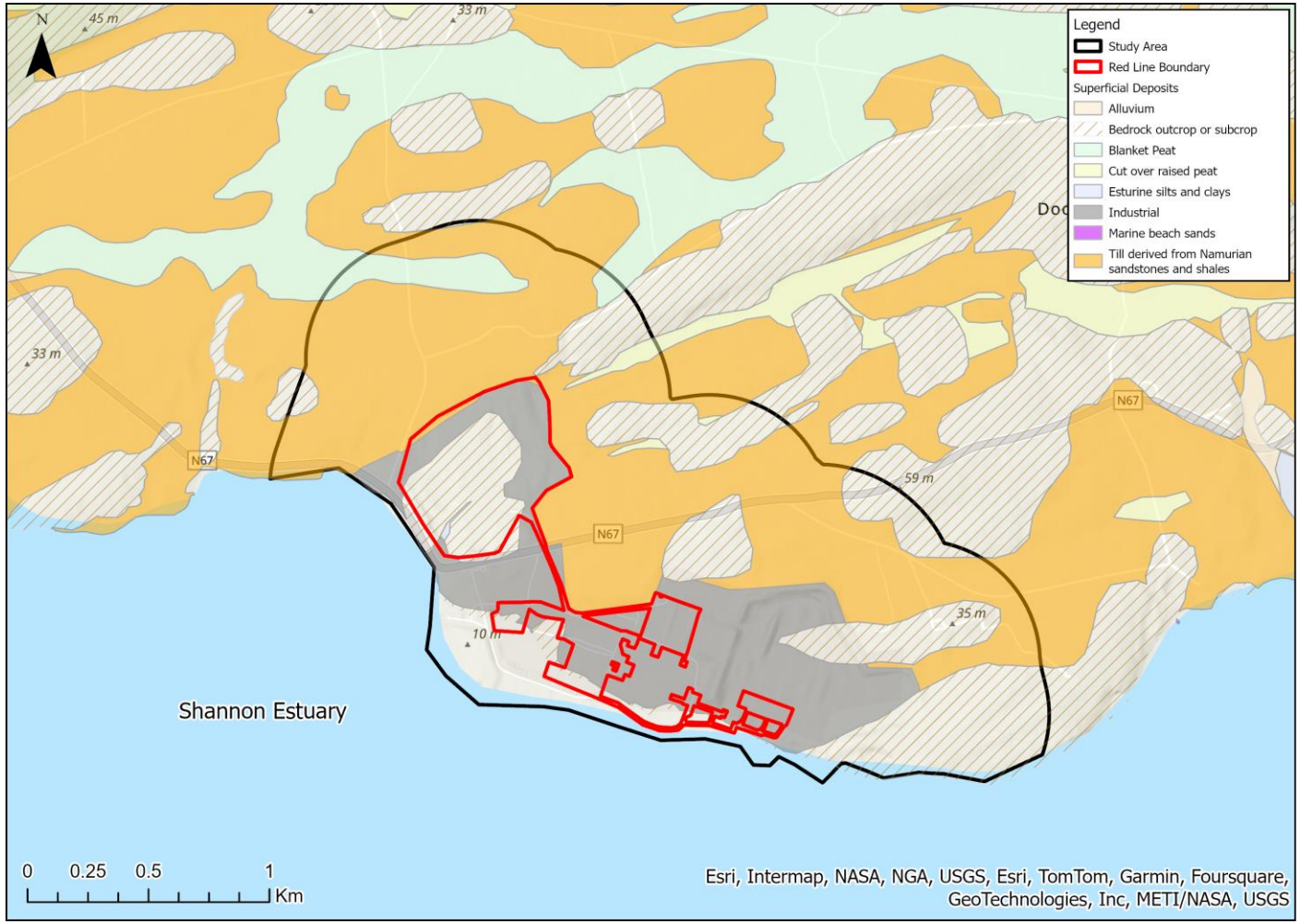
12.4.2.2 Superficial Deposits

The Geological Survey Ireland indicates that the superficial deposits underlying the site are predominantly industrial/urban and therefore considered ‘Low’ sensitivity (Geological Survey Ireland, 2023). Areas of bedrock outcrops or subcrops are present in the Ash Storage Area to the north-west and along the coast in the southern region of the study area.

Glacial Till, derived from Namurian Sandstones and Shales, is generally an abundant deposit in West County Clare. The Shannon Estuary has been subjected to at least two major glaciations. The dominant glacial tills in the area are associated with the younger Midland Glaciation which reached its maximum extent about 21,000 years ago (Soils Mechanics, 1979). The glacial till found in the study area is described as a ‘compact, essentially structureless red-brown clay and silt matrix with a gravel and cobble content derived from the local bedrock of sandstones and shales’ (Soils Mechanics, 1979). The original station development involved materials removal and substantial rock breaking to create level terraces for construction with the result that any Glacial Till overburden formerly present at the site is now substantially removed (ESB, 2018). The distribution and extent of superficial deposits within the study area can be found in Figure 12.4.

Smaller deposits of peat can be found in the north of the study area. Although peat is hugely important to the natural environment, there is no anticipated impact from the proposed development on these deposits due to the distance of peat deposits to the red line boundary as well as its location upgradient of the site.

Figure 12.4: Distribution of Superficial Deposits across the Study Area



Source: (Geological Survey Ireland Spatial Resources, 2023)

12.4.2.3 Bedrock Geology

The geology and geological features of the site have been determined from the Geological Survey Ireland (GSI) database (Geological Survey Ireland, 2023). A review of the Bedrock Geology 1:100000 map shows that the bedrock geology comprises five cyclothems of mudstone, siltstone and sandstone belonging to the Central Clare Group (Figure 12.5). The Namurian sediments have a maximum thickness of 1,500m and rest directly on the Visean Limestones (Soils Mechanics, 1979). The basal mudstone is 7-18m thick and laminated. In general, the mudstones are overlain by laminated to massive mudstones followed by thick laminated and cross-bedded siltstone or sandstone (Golder Associates Ireland Ltd, 2022). Site specific information regarding bedrock geology can be found in Table 12.7 within Section 12.4.2.4.

The study area is absent of recorded structural geological features, including faults, fissures and folds. A dip and strike measurement taken within the study area (Irish grid reference: 102692E, 151919N) indicates that bedrock has a relatively shallow dip of 10° towards the south (Geological Survey Ireland, 2023).

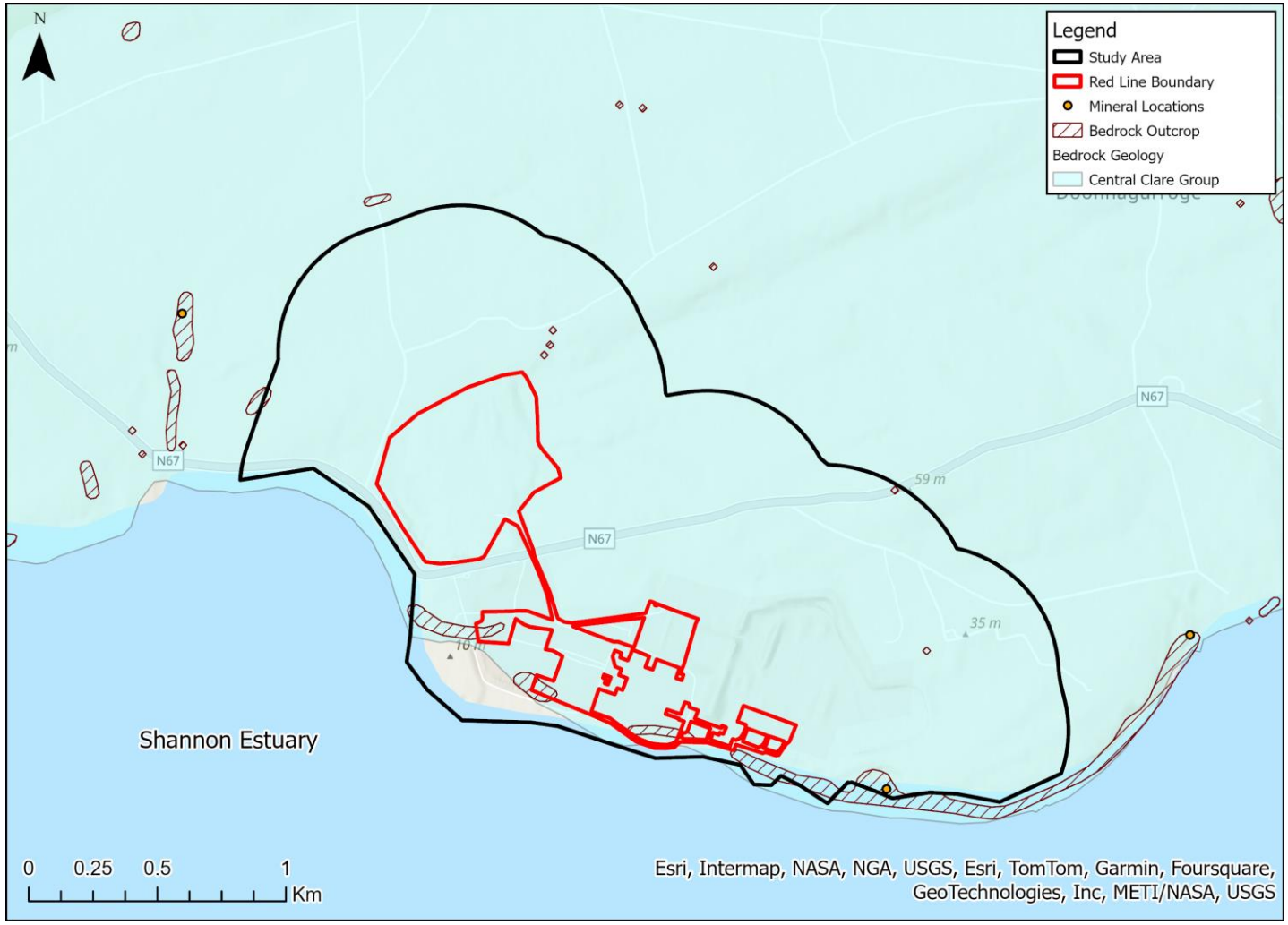
One mineral locality, a disused sandstone quarry, occurs within the study area *c.*110m southeast of the red line boundary (Figure 12.5). Three additional mineral localities (pyrite, coal) occur locally to the study area, shown in Figure 12.5. A high aggregate potential for crushed rock is identified in and around the site location. The sensitivity of the Central Clare Group is considered ‘High’ due to the potential degree/extent of contamination on a local scale.

No karst landforms are identified within or local to the study area. A drumlin landform is identified within the study area[149] and occurs on the eastern side of the ownership boundary.

[149] Fealy, R. M., Green, S., Loftus, M., Meehan, R., Radford, T., Cronin, C. & Bulfin, M. (2009). Teagasc EPA Soil and Subsoils Mapping Project-Final Report. Volume I. Teagasc. Dublin

Source: OSi DEM and Teagasc Subsoil Map (Geology (arcgis.com))

Figure 12.5: Bedrock Geology, Bedrock Outcrops and Mineral Locations within the Study Area



Source: (Geological Survey of Ireland, 2023)

12.4.2.4 Ground Investigation Data

A series of four boreholes were drilled by Priority Drilling Limited in October 1971 at the site. Following this, a series a trial pits were excavated and logged by ESB in 1978.

Prior to construction of the power station in March 1979, 147no. investigation boreholes were drilled to a maximum depth of 42.50m during site investigations carried out from early June to mid-December 1978 (Soils Mechanics, 1979). The borings and excavations revealed a generally thin cover of glacial till overlying Carboniferous sandstones, siltstones and mudstones with rare thin coals.

A summary of the ground conditions encountered in the boreholes, prior to the construction of the powerplant, can be found below in Table 12.7. The thickness and descriptions of the strata within this table are general and representative of the 147 borehole logs across the site.

Table 12.7: Summary Ground Conditions Recorded from March 1979 Ground Investigation

Stratum	Description	Thickness Range (m)	Thickness Average (m)
Topsoil	• Loose brown / red-brown / orange-brown slightly sandy clayey SILT with some gravel and cobbles and numerous roots.	0.1-0.9	0.3
Post-glacial deposits	• Generally loose grey / brown silty SAND and sandy SILT or soft grey silty CLAY with some gravel and cobbles (inorganic deposits)	0.1-9.0	1.0
	• Very soft black clayey SILT and plastic and spongey PEAT (organic deposits)	0.4-4.5	1.8
Glacial Deposits	• Generally medium dense to dense GRAVEL and COBBLES in a matrix of grey brown sandy clayey silt.	0.1-7.3	1.8
Weather Bedrock	• Highly weathered laminated mottled grey and green / orange very weak to moderately weak SANDSTONE / SILTSTONE / MUDSTONE	0.3-4.0	1.3
Bedrock	• Fresh to slightly weathered laminated to very thinly bedded grey moderately weak to very strong SANDSTONE / SILTSTONE / MUDSTONE.	Up to 39.9m penetrated	

Source: (Soils Mechanics, 1979)

Since 1978 (when site investigation was carried out), most of the soil and sub-soil at the site will have been stripped during the construction of the powerplant and replaced with manmade materials. The thickness and descriptions of the strata post-construction can be found below in Table 12.8.

Moneypoint Generating Station has been subject to multiple site investigations as part of licensing process and previous planning applications leading to further ground investigation.

Six boreholes (BH01-BH06) were drilled around the perimeter of the Ash Landfill in 1993, in order to monitor groundwater. Some boreholes were progressed into the bedrock beneath.

In 2002-2003, a site wide investigation was carried out in accordance with the Site's IPPC licence requirements to install groundwater monitoring wells. In total, 26 no. boreholes (BH07-BH33) were advanced throughout the site and groundwater and surface water samples were collected for laboratory analysis of major ions, metals and hydrocarbons. Condition 6 and Schedule C of the extant IE licence requires biannual groundwater monitoring to be carried out at the site. Groundwater sampling monitoring wells were installed during the 2002 site

investigation. The current status of groundwater monitoring on site is detailed in Section 12.4.3.1.

The 2012 geotechnical investigation focussed on the 400 kV substation north of the generating station; the waste transfer station to the east of the substation; and the proposed waste transfer station and yard in the generating station area. 19 no. boreholes (BH-01-BH-18) were advanced to <1m bgl (terminated at bedrock). A further 8 no. boreholes (BH-19-BH-26) were drilled into bedrock in 2013, due to the shallow depth achieved the previous year.

Following a HFO spill in 2021, Ground Investigations Ireland Limited (GII) were appointed by Golder to drill 4 no. boreholes (GABH01, GABH02(S), GABH02(D), GABH03) to a target depth of 5.5-7.5 m bgl for the purpose of groundwater monitoring. While no ground investigation works have been carried out for the proposed development, Borehole GABH02(D) advanced in 2021 is generally representative of ground conditions with the study area.

Table 12.8: Borehole log (GABH02(D))

Stratum	Description	Depth (m)	Thickness (m)
Made Ground	Made Ground comprising loose grey to brown sandy silty gravelly cobbles and boulders with mixed debris. Sand is fine to coarse. Gravel is very large and sub-angular to sub-rounded. Cobbles are small to very large. Boulders are small to very large.	1	1
Concrete		1.2	0.2
Made Ground	Made ground comprising loose grey to brown sandy silty gravelly cobbles and boulders with mixed debris. Sand is fine to coarse. Gravel is very large and sub-angular to sub-rounded. Cobbles are small to very large. Boulders are small to very large.	3.6	2.4
Bedrock	Very dense, light grey to dark grey, very fine to medium grained sandstone and siltstone	Up to 7.5m penetrated	>3.9m

Source: (Golder Associates Ireland Ltd, 2022)

12.4.2.5 Geological Heritage

Geological heritage sites have been identified from GSI Geological Heritage mapping (Geological Survey of Ireland, 2021). There are no geological heritage sites within 500m of the proposed development. There is a proposed Natural Heritage Area, St. Senan's Lough that lies approximately 3km north from the application site. No County Geological Sites have been identified in and around the study area from the GSI Environmental Sensitivity Mapper (Geological Survey of Ireland, 2023).

12.4.2.6 Landslides

Landslide events and susceptibility have been identified from GSI Geohazard mapping. No landslide events have been recorded in the study area. The landslide susceptibility within 500m of the scheme is 'low', with a susceptibility classification 'D'.

12.4.2.7 Radon

According to the Environment Protection Agency Ireland, the radon risk in the study area is high. About one in ten houses in the site location is likely to have high radon levels, wherein, the 1 in 5 houses to the east of the site location is likely to have high radon levels.

12.4.2.8 Contaminated Land

Due to the extensive industrial history of this area, it can be assumed that underlying soils, geology and groundwater have been exposed to some degree of contamination since Moneypoint Quarry was operational.

Following the accidental release of Heavy Fuel Oil (HFO) at the Moneypoint Generating Station complex on 05 May 2021, an Environmental Site Assessment (ESA) was conducted by WSP Golder Ireland Limited. From the soil samples analysed, the soil has possibly degraded with HFO up to 2.6m below ground level (bgl) at BH02 (GR 103112 152598) (Golder Associates Ireland Ltd, 2022). Concentrations of phenols were below the detection limit for all the samples. Potential contaminants include poly aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), Volatile and Semi-Volatile organic carbons, and phenols. This is not necessarily indicative of the proposed development since no soil has been sampled and analysed since November 2021, and the area assessed in 2021 only forms a part of the red line boundary for proposed development.

Golder (Golder Associates Ireland Ltd, 2022) concluded the following:

- ‘A high risk that localised HFO impact is present within the made ground and may have vertically migrated through soils and unsaturated bedrock to the underlying aquifer’;
- ‘A moderate risk that HFO has laterally migrated along the defected drainage system acting as a preferential pathway towards the Shannon Estuary ie., the nearest downgradient surface water receptor’.
- Field observations and soil analytical results have demonstrated that Contaminants of Potential Concern (COPCs) are present in the shallow made ground material in the vicinity of the blowdown sump and water drainage infraction close to the blowdown sump.
- The GWRA also concluded that the clean-up of the drainage line from the blow down sump to the oil/water interceptor has reduced the potential loss of HFO outside of the drainage network. The residual impacts in the shallow soil were considered minor as the drainage network did not release a significant quantity of HFO (Golder Associates Ireland Ltd, 2022). Despite this conclusion, Golder acknowledges that the inferred environmental, geological, geochemical and hydrogeological conditions between sampling sites may actually differ from those that actually exist.

12.4.3 Hydrogeology

Groundwater karst features, aquifer designations, aquifer vulnerability, springs, boreholes and groundwater Source Protection Areas (SPA) have been reviewed using GSI Groundwater Data Viewer.

12.4.3.1 Aquifers and Groundwater Flow

Aquifer types are grouped by the GSI according to resource potential (regionally important, locally important or poor) and the type of groundwater flow (fissures, karst conduits or intergranular). The bedrock aquifer is classified as ‘LI - Locally Important – Bedrock is Moderately Productive only in Local Zones’ and hence classified as ‘Medium’ sensitivity by GSI. There are no sand and gravel aquifers and groundwater Source Protection Areas (SPA) identified within the study area. The nearest SPA is located across the Shannon Estuary, ~10.2km south-east of the study area.

The general direction of groundwater flow is southwards towards the River Shannon, although this could be influenced locally by underground structures modifying groundwater migration pathways and surface developments intercepting rainfall and diverting this into drainage systems. Fracturing within the bedrock may also locally alter the groundwater flow direction,

however, groundwater is expected to discharge to the Shannon Estuary. Due to the proximity to the coastline, it is expected that groundwater within this area would be brackish at shallow depth with a low water resource potential.

A number of other groundwater monitoring BHs (BH01-BH32) are installed on site as shown in Figure 12.6. Over time, some wells have become damaged preventing sample collection and others routinely or seasonally dry (Golder Associates Ireland Ltd, 2022).

Under the terms of Schedule C.6 of the site's IEL, groundwater monitoring is required from at least 30 monitoring wells (BH01-BH12, BH14-BH24, BH25A, BH27A and BH28-BH32) on a biannual basis (AECOM, 2023). As previously outlined in Section 12.4.2.4, four boreholes (GABH01, GABH02(S), GABH02(D), GABH03) were also advanced in 2021 for the purpose of groundwater monitoring.

Groundwater from monitoring wells at the ESB Moneypoint site was sampled during 2020 and analysed for a comprehensive suite of organic and inorganic parameters (AECOM, 2022). The results concluded:

- Diesel Range Organics (DRO) was detected in groundwater from BH23 (53 µg/L) in September 2021. As the concentration was below the laboratory MDL in all previous and subsequent monitoring rounds, this detection is considered to be a one-off occurrence.
- Elevated concentrations of the following metals and major ions were detected within the RLB:
  - Aluminium, Arsenic, Chromium, Nickel and Copper in BH10 and BH21 (25m east of the RLB);
  - Barium in BH21 (25m east of the RLB) and BH09 (40m south-east of the RLB);
  - Boron BH05, BH10, BH15 and BH22 (~57m south of the RLB);
  - Cadmium and Mercury in BH21 (25m east of the RLB);
  - Lead in BH10, BH12 and BH21 (25m east of the RLB);
  - Zinc in BH10, BH12, BH21 and BH27 (~87m south of the RLB).
- In some cases, the concentrations exceeded the defined IEL trigger levels. Elevated concentrations may be associated with the site's coastal setting and the influence of brackish/saline water from the estuary on groundwater.
- Groundwater from wells located at the Ash Storage Area (ASA) (BH01 and BH05), the waste / coal yard area (BH21), and on the eastern edge of the coal yard (BH08, just up hydraulic gradient from BH21) contained ammonia concentrations above 1 mg/L, exceeding the IEL trigger level.
- Readings of groundwater pH were generally close to neutral in IE licence monitoring rounds, ranging between 6.1 (BH09 in July 2021) and 8.8 (BH08 in September 2021).
- Following a release of HFO at Moneypoint Generating Station 5th May 2021, a round of groundwater monitoring was completed at existing boreholes BH12 and BH22 in November 2021. A second round of groundwater monitoring was conducted on existing boreholes BH12 and BH22, as well as the newly installed boreholes (GABH01, GABH02(S), GABH02(D), GABH03, in 2021. In addition, four grab samples were collected from trial pits (TP02, TP02A, TP04 and TP05A) (Golder Associates Ireland Ltd, 2022). The results concluded:
- Extractable Petroleum Hydrocarbons (EPH) interpretation was not possible on any samples analysed due to results being below the method detection limit (MDL). Concentrations of TPH, VOCSs, SVOCs and Phenols were also less than their MDLs.
- PAH compounds were detected in samples TP02 (0.263 µg/L total PAH) and TP04 (0.174 µg/L total PAH).

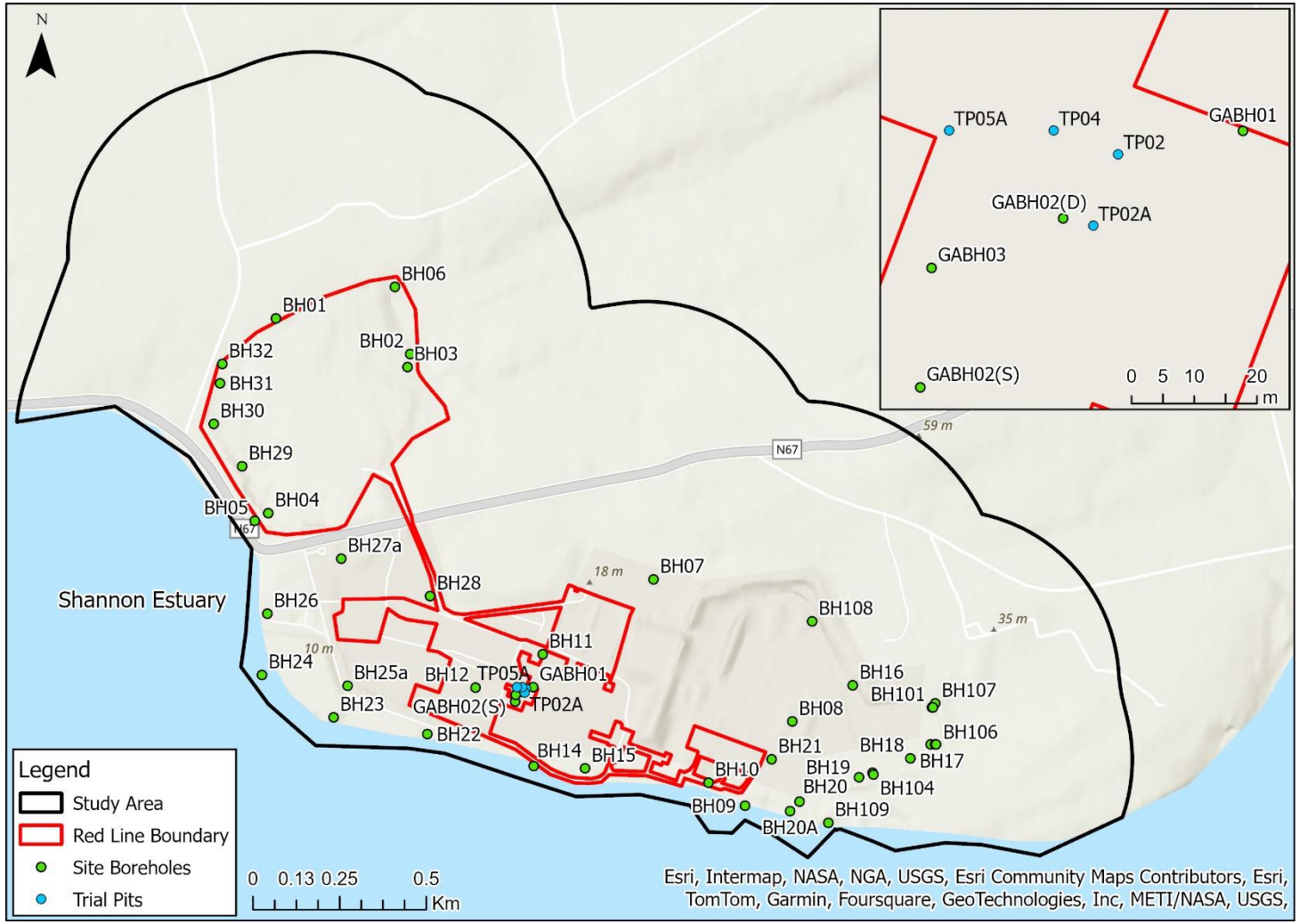
- Dissolved Sodium concentrations range from 3.8 mg/l at TP04 to 9026.5 mg/l at BH22. Concentrations of dissolved Sodium at BH22 ranged from 8745.4 mg/l on 03 November 2021 to 9026.5 mg/l on 17 December 2021. This is attributed to the location of BH22 near the foreshore, where Sodium concentrations within groundwater are likely to be tidally influenced.
- Dissolved Chloride concentrations ranged less than the MDL at TP02, to 15422 mg/l at BH22 on 03 November 2021. Concentrations of dissolved Chloride, recorded on 17 December 2021, were lower at 14000.1 mg/l. As above, elevated concentrations are considered to be due to saline intrusion.

The most recent available groundwater quality report was published in 2023, addressing groundwater monitoring carried out in 2022 (AECOM, 2023). The following conclusions were made:

- For the majority of wells sampled in 2022, pH readings were within the trigger level range given in the IEL (5.5-8.9). The only readings that exceeded the higher trigger level were at BH08 and BH29 with values of 9.0 and 9.2 respectively.
- Due to the coastal setting of the site, groundwater electrical conductivity, Sodium and Chloride concentrations were elevated at boreholes located closer to the foreshore.
- With the exception of total organic carbon (TOC) and oils, fats and grease (OFG), results for all other organic parameters (TPH, DRO, mineral oils, petrol range organics (PRO), BTEX compounds and PAHs) were below their respective MDLs in all groundwater samples in 2022.
- Concentrations of aluminium, arsenic, barium, boron, cadmium, chromium, copper, lead, nickel and zinc exceeded thresholds in groundwater from at least one monitoring well during 2022. The following metals and major ions were detected within the RLB:
  - Aluminium in BH05, BH09 (40m south-east of the RLB), BH10, BH12, BH15, BH21, BH27 (~87m south of the RLB);
  - Arsenic in BH01, BH10 and BH21;
  - Barium in BH01, BH09 (40m south-east of the RLB), BH12 and BH21;
  - Boron in BH05, BH10, BH15 and BH22 (~58m south of the RLB);
  - Cadmium in BH21;
  - Chromium and Copper in BH10 and BH21;
  - Lead in BH10, BH12, BH21;
  - Nickel in BH10, BH21 and BH27 (~87m south of the RLB);
  - Zinc in BH10, BH12, BH21 and BH27 (~87m south of the RLB).
- Concentrations of molybdenum, selenium and tin did not exceed screening criteria.
- Iron and manganese were detected in groundwater from all monitoring wells, with concentrations in most exceeding their corresponding Interim Guideline Values (IGVs). Elevated concentrations are indicative of reducing (anaerobic) groundwater conditions.

The location of all boreholes and trial pits referred to above can be found in Figure 12.6**.**

Figure 12.6: Site Boreholes and Trial Pits within the Study Area (Boreholes 01 – 32 are sampled biannually under the Sites IEL Licence)

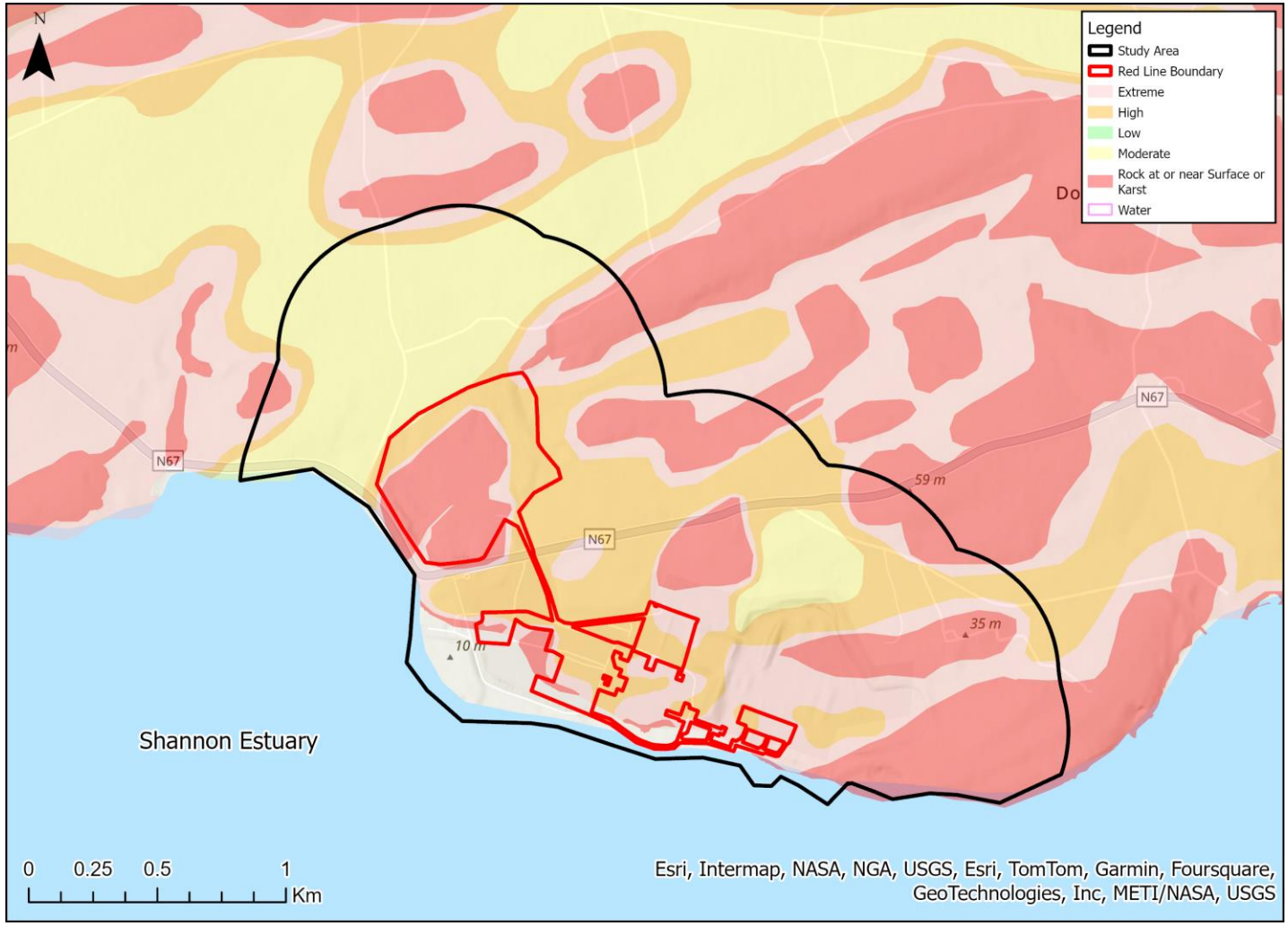


Source: (AECOM, 2022), (Golder Associates Ireland Ltd, 2022), (AECOM, 2023)

12.4.3.2 Groundwater Vulnerability

Groundwater vulnerability has been identified using GSI Groundwater Data Viewer. Groundwater vulnerability indicates how rapidly contaminants on the ground might reach the aquifer and is a function of soil and sub-soil thickness and permeability. Areas where there is no soil or subsoil protection above an aquifer (i.e., outcrops) are considered highly vulnerable. Because any protective superficial cover has been removed for the construction of the power station, groundwater vulnerability underlying the Moneypoint Generating Station is predominantly high to extremely vulnerable, with areas of rock at or near surface.

Figure 12.7: Groundwater Vulnerability in the Study Area



Source: (Geological Survey of Ireland, 2023)

12.4.3.3 Groundwater Wells and Springs

Groundwater wells and springs have been identified using GSI Groundwater Data Viewer (Geological Survey of Ireland, 2019). This contains records of boreholes, dug wells, springs and ground site investigations (Contains Irish Public Sector Data (Geological Survey Ireland) licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence").

As there are no Group Schemes or Public Supply Source Protection Areas and Group Water Scheme Abstraction Points (NFGWS) within the study area, the sensitivity of borehole abstractions has been considered as follows:

- Abstraction for industrial or agricultural use is considered Medium sensitivity; and
- Abstraction for unknown, private drinking water, domestic supply is considered Very High sensitivity.

The sensitivity of groundwater-fed wells and springs is considered as follows:

- Groundwater-fed springs and wells are considered Very High sensitivity.

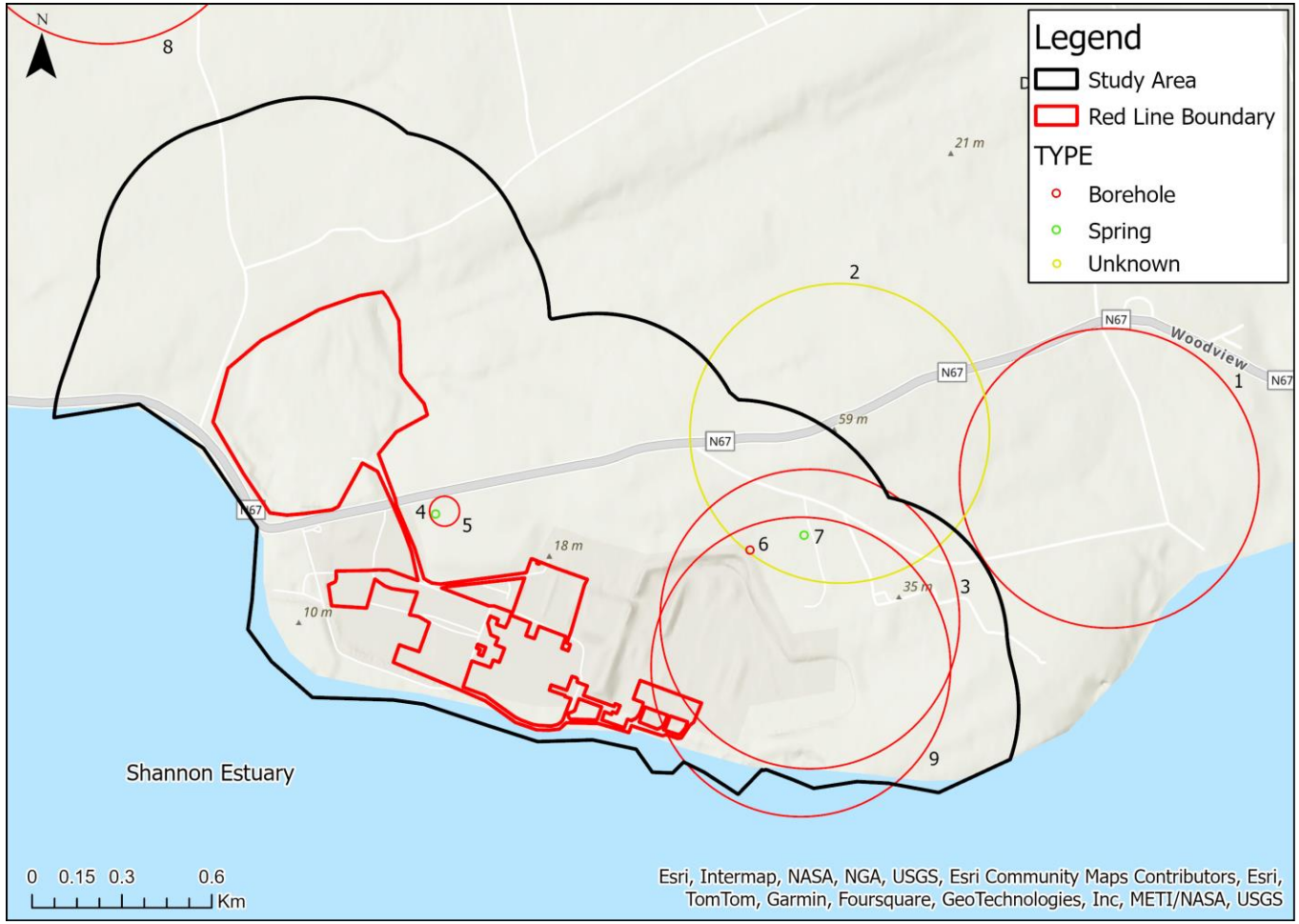
According to the Groundwater Geological Survey Ireland, there are four boreholes, one dug wells, and two springs within the study area boundary. The details of these wells and springs, as well as those in the surrounding area, are outlined below in Table 12.9 and Figure 12.8.

The current status of these features is not provided by the Geological Survey of Ireland. Boreholes identified on the Geological Survey Ireland Public Data Viewer may have since been infilled and decommissioned. Furthermore, the spring identified at Irish grid reference :103250E, 152080N may have been culverted prior to the construction of the Moneypoint Generating Station. Despite the lack of information associated with these features, it cannot be assumed that they are not present.

Table 12.9: Wells and Springs in the Study Area

ID (see Figure 12.8)	GSI Name	Well Type	Drill Date	Location accuracy	Depth (m)	Easting	Northing	Use	Yield (m^3d)	Yield Class	Sensitivity
1	0815SEW006	Borehole	01-Jul-1965	1 km	29.7	105500	152200	Agriculture and domestic			Medium to Very High
2	0815SEW022	Unknown	15-Dec-1970	1 km	4	104600	152350	Agriculture and domestic	27.3	Poor	Medium to Very High
3	0815SEW054	Borehole	01-Mar-1979	1 km	43.9	104500	151730	Industrial	38.2	Good	Medium
4	0815SEW052	Spring	30 -Dec-1899	20 m	32	103250	152080	Domestic	49.1		Very High
5	0815SEW056	Borehole	01-Jan-1982	100 m	34.7	103280	152090	Industrial	38.2	Good	Medium
6	0815SEW055	Borehole	01-Jan-1982	20 m	37.5	104300	151960	Industrial	93	Poor	Medium
7	0815SEW053	Spring	30-Dec-1899	20 m	7.9	104480	152010	Domestic			Very High
8	0815SEW025	Borehole	03-Jul-1973	1 km	18.3	102150	154150	Agriculture and domestic	27.3	Poor	Medium to Very High
9	0815SEW057	Borehole	30-Mar-1981	1 km	53.6	104470	151570	Other	32.7		Medium

Figure 12.8: Wells and Springs in the Study Area



Source: (Geological Survey of Ireland, 2023)

12.4.3.4 Groundwater Recharge and Flow Direction

From the groundwater recharge map, the recharge co-efficient for the site is 20%. This implies an average recharge of 136mm/year, given the effective rainfall of about 680mm/year. Groundwater flow direction follows the topographic gradient, which is from north to south/south-southeast. It is expected to discharge to the Shannon Estuary. Groundwater levels were obtained from multiple boreholes on site during the December 2021 during an Environmental Site Assessment carried out by Golders Associates (Golder Associates Ireland Ltd, 2022). Groundwater levels were taken for the purpose of the 2021 site investigation following the release of HFO. However, flow direction is representative of that underlying the proposed development. Groundwater level information can be found below in Table 12.10 and the sampling locations can be observed in Figure 12.6. All monitoring wells were surveyed to Ordnance Datum and groundwater elevations were calculated allowing the flow direction to be estimated.

Table 12.10: Groundwater Levels recorded on 16 December 2021

Site Borehole ID	Depth to Groundwater (mbtoc)	Well Depth (mbtoc)	Screened Depth (mbtoc)	Well Elevation (mOD)	Water Level (mAOD)
GABH01	1.37	5.51	2.0-5.5	5.51	4.14
GABH02(S)	2.13	2.50	1.5-3.5	5.89	3.75
GABH02(D)	2.90	7.54	5.0-7.5	5.89	3.0
GABH03	1.17	3.90	2.8-4.0	6.07	4.89
BH12	3.88	20.25	14.5-20.5	7.02	3.14
BH22	6.07	15.72	3.0-15.7	5.75	-0.33

Source: (Golder Associates Ireland Ltd, 2022)

mbtoc = metres below top of casing
mAOD = metres Above Ordnance Datum
Note: reference point used to measure water levels was the top of casing

12.4.3.5 WFD Groundwater Status

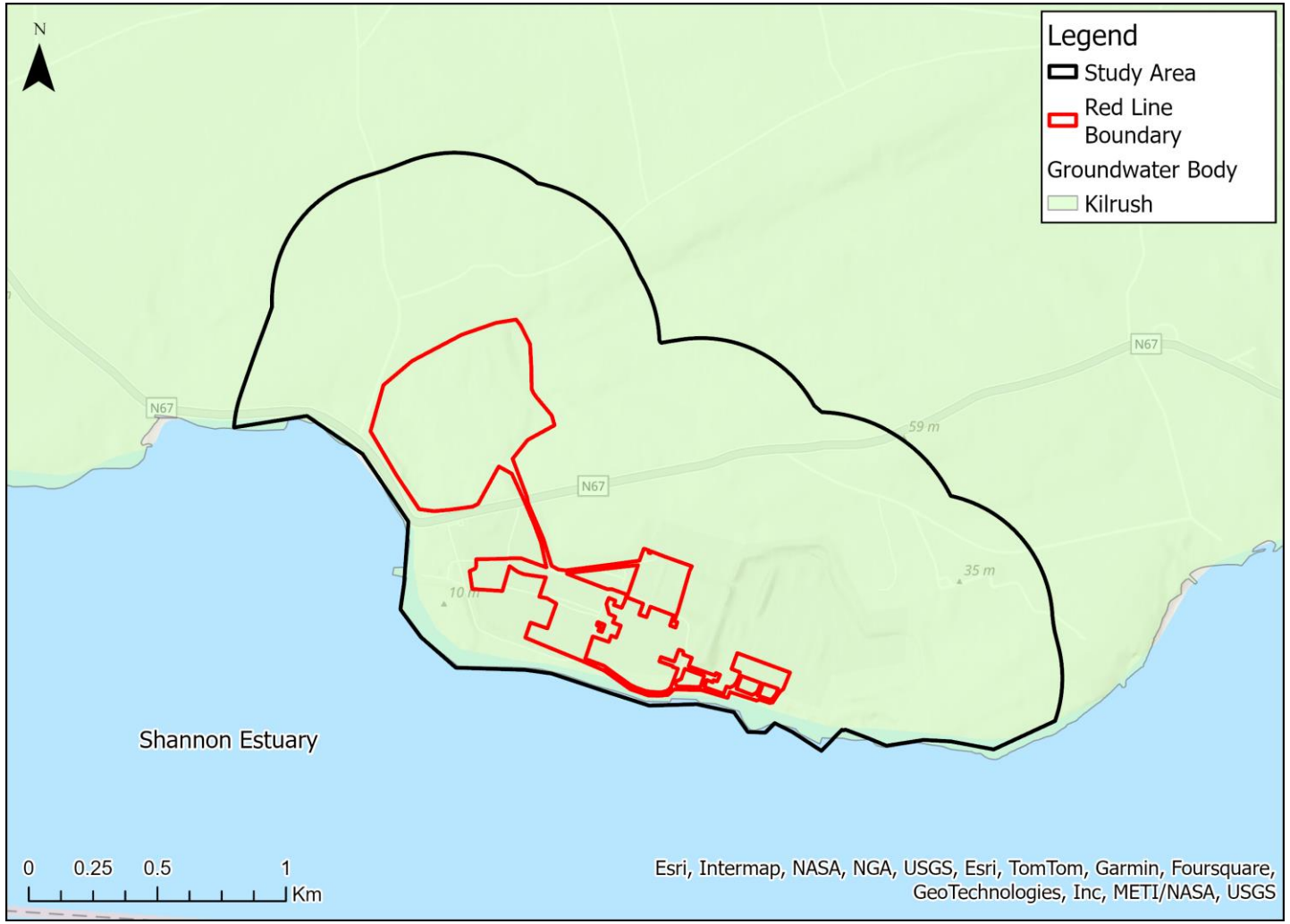
Kilrush (EU Code: IE_SH_G_123) is the WFD groundwater body (GWB) underlying the entire site (Figure 12.9).

The WFD groundwater monitoring programme has assessed the groundwater chemical and quantitative figures. The chemical and quantitative GWB WFD status is recorded “good” for Kilrush during the period 2016 – 2021 and consequently the overall classification is Good status for the 2016-2021. The current WFD risk result for the body is ‘Not at Risk”.

All the WFD GWBs in the area are classified as Drinking Water Protected Areas (Environmental Protection Agency, 2023), due to the *potential* for qualifying abstractions of water for human consumption as defined under Article 7 of the Water Framework Directive. The groundwater drinking water protected areas (DWPA) are represented by the full extent of each WFD GWB (Environmental Protection Agency, 2018).

The southern, coastal boundary of the Kilrush GWB borders the River Shannon and River Fergus Estuaries Special Protection Area (SPA) and the Lower River Shannon Special Area of Conservation (SAC).

Figure 12.9: WFD Groundwater Bodies within the Study Area



Source: (Environmental Protection Agency, 2023)

12.5 Likely Significant Impacts

Construction phase impacts include those which have the potential to impact the following receiving environments:

- Land and Land Use
- Soils and Geology
- Hydrogeology

12.5.1 Do Nothing

The do nothing scenario is discussed in Chapter 3 of this EIAR. In a do nothing scenario, there would be no immediate impact on the baseline conditions of the proposed site regarding land, soils and hydrogeology. The existing Moneypoint Generating Station complex is an Industrial Emissions (IEL) site and will continue to comply with the conditions on the IE licence.

12.5.2 Construction Phase

The construction phase for the proposed development comprises of two new HFO tanks to double existing HFO storage (to an on-site combined total of 100,000 tonnes), construction of two auxiliary boilers and associated boiler house, the modification of the existing Ash Storage Area to allow for additional FGD by-product storage, new reclaimed ash unloading facilities at the batching plant and Flue Gas Desulphurisation (FGD) absorbers and finally the partial dismantling of the coal yard, as described in Chapter 4 of this EIAR. The construction phase for the proposed development comprises pre-construction works, demolition works and plant construction works, as described in Chapter 4 of this EIAR.

The current estimates of excavated, reused and disposed material volumes are summarised below in Table 12.11.

Excavated material will be tested for reuse. If the material is proven uncontaminated and suitable for its intended purpose, it will be reused by the scheme. It is envisaged studies to be carried out to determine the suitability of materials to be reused within the proposed development. The envisaged studies include:

- A Generic Quantitative Risk Assessment that will assess the risk to onsite and offsite environmental and human health receptors
- A soil/material waste classification report looking at the material around the HFO tanks and elsewhere within the red line boundary that is to be removed and classifying this material
- A material reuse plan to look at the fill material around the HFO tanks and adjudge its suitability to be used as fill material during the construction works

Subsoil from the service trenches and stone is considered likely to be non-reusable and is categorised as ‘export’. It is anticipated that only a nominal amount of site-won material would be reused in the proposed development, due to the potential poor quality of the material and its unsuitability for use as structural fill. Imported material will be used for additional fill for land drains, structure sub-bases and levelling around the walls.

Table 12.11: Excavation, Reuse and Disposal Volume Summary

Description	Topsoil, m^3	Subsoil, m^3	Total, m^3
Total Excavated	5050	570	5620
Reused by the proposed development	240	0	240
Residual for disposal	4810	520	5330
% of material reused	5%	0%	4%

Source: ESB

Note: The bulking factors are not considered for these volumes.

Waste is also anticipated to arise at the proposed development considering that the proposed development will include the partial decommissioning and removal of coal handling plant and the dismantling of associated buildings with the removal of structures to ground level. This includes six tonnes of waste oil, as discussed in detail in Chapter 16 Material Assets and Waste Management.

While is not anticipated that any excavations will require dewatering, the potential impacts of dewatering are addressed in Table 12.12.

Assessment of construction phase effects is given in Table 12.12.

Table 12.12: Construction Phase Assessment of Effects

Receiving Environment	Construction Phase Impacts	Magnitude of impact, sensitivity, and effect	Avoidance and mitigation measures included in design	Post mitigation residual significance of effect	Duration of Effect
Land Use	No land use changes anticipated during construction phase from proposed scheme.	Magnitude of Impact: **Negligible / Neutral** Receptor Sensitivity: **Medium** Significance of Effect: **Imperceptible**	None required	**Imperceptible**	Construction (temporary and permanent)
	Mobilisation of contaminants can pose an impact to the adjacent land to the site.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	Correct adherence to the CEMP (must include the development of a pollution prevention plan) and a construction waste management plan will reduce this risk. Contaminated materials identified during site works will be subject to review and additional risk assessment. Excavated material will be tested for reuse. If the material isn't contaminated, it will be reused by the scheme. The following reports to be undertaken following the completion of the site investigation work will help identifying and classifying contaminated land: 1. A Groundwater Quality Risk Assessment (GQRA) to assess the risk to onsite and offsite environmental and human health receptors; 2. A soil/materials waste classification report classifying the material around the HFO tanks and elsewhere within the RLB that is to be removed. 3. A material reuse plan to investigate the fill material around the HFO tanks and adjudge its suitability to be used as a fill material during construction works.	**Imperceptible**	Construction (temporary)
Land and Soils	Levelling and grading of the site to include a soil strip will be required in preparation for the main development works, including clearance of vegetation (areas of shrub) within the boundary of the proposed HFO tanks.	Magnitude of Impact: **Negative. Small Adverse** Receptor Sensitivity: **Medium to High** Significance of Effect: **Slight / Moderate**	Bund areas will be backfilled using imported and compacted engineered graded material to make up the required levels for the site. If excavated material is deemed suitable and uncontaminated, it will be reused for infill.	**Imperceptible**	Construction (permanent)
	Removal of material from site as waste (see Table 12.11) is proposed. The bulk of the material to be excavated is soil. No bedrock will be excavated. The removal of material is small and shallow relative to the size of the site and will not affect the use of the site.	Magnitude of Impact: **Negative. Small Adverse** Receptor Sensitivity: **Medium to High** Significance of Effect: **Slight**	None required	**Slight Adverse**	Construction (permanent)
Geology and Soils	A maximum volume of 21,840m^3 of material will be required for the Aux Boiler, Ancillary Structures and HFO Bund Walls, Floor and Foundations. The material will be imported to site for direct infilling with some short-term stockpiling undertaken to facilitate construction operations where necessary.	Magnitude of Impact: **Positive. Small Beneficial** Receptor Sensitivity: **High** Significance of Effect: **Slight / Moderate**	**The material utilised for site raising will be geotechnically and chemically suitable for use on the site and will be imported to the site in accordance with best practice and all relevant environmental legislation.** Contaminated soil and subsoil will be exported and replaced with clean materials which will overall improve the ground quality underlying the site. For further information refer to Chapter 16 Material Assets and Waste and the accompanying RWMP.	**Slight / Moderate Beneficial**	Construction (temporary and permanent)
	Disturbance and remobilisation of contaminants when removing existing ash from current designated cells within the Ash Storage Area (ASA) as well as the movement of landfilled ash and excavation of HFO bunds. Following the removal of existing ash, a	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity:	**Contaminated materials identified during site works will be subject to review and additional risk assessment and, if necessary, remediation and/or removal.** **All materials to be moved are to be classified according to Waste Management Act 1996 (as amended) and associated**	**Imperceptible**	Construction (temporary)

Receiving Environment	Construction Phase Impacts	Magnitude of impact, sensitivity, and effect	Avoidance and mitigation measures included in design	Post mitigation residual significance of effect	Duration of Effect
	liner will be installed, and the cell will be used for future storage of FGD by-product.	**High** Significance of Effect: **Moderate / Significant**	**regulations and subject to a materials management plan. For further information refer to Chapter 16 Material Assets and Waste and the accompanying RWMP.**		
	Potential to encounter contaminated soils when excavating the Made Ground via human contact	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate / Significant**	The risk to construction workers from dermal contact, inhalation, or ingestion of contaminated soil is excluded from this assessment as standard good practice measures will be adopted to minimise exposure. These measures will include appropriate PPE to be worn during construction, provision of hygiene facilities and prohibitions on eating and smoking on site outside welfare areas. The use of PID on site. The appropriate health and safety risk assessment will be in place, along with a required site induction and training for all staff.	**Imperceptible**	Construction (temporary)
	There is a potential for the creation of residual contaminated soils during decommissioning and removal of the coal handling plant and the dismantling of associated buildings with the removal of structures to ground level if: 1. Contaminated water causes runoff during the decommissioning plants handling coal. 2. Asbestos Containing Materials (ACM) from plant and buildings are identified.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate / Significant**	Processes are in place for any ACM to be removed by an approved Specialist Asbestos Contractor and air-testing completed, prior to demolition if required. All water runoffs shall be collected and disposed of off-site at an appropriate environmentally licenced facility.	**Imperceptible**	Construction (temporary and permanent)
	Contamination risk from increased use of vehicles during construction, that have the potential to leak/spill hydrocarbons onto the road surface. Construction vehicles may also transport detritus onto public roads.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate**	A Traffic Management Plan (TMP) will be required to be implemented during both stages of the development, including details of wheel washes and/or judder bars on site.	**Imperceptible**	Construction (temporary and permanent)
	An estimated 6 tonnes of oil, anticipated to be classified as hazardous waste, will arise from the partial dismantling of the coalyard. Accidental spillage / leakage of oil poses contamination risk to underlying soils, geology and groundwater.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate**	Oil arisings will be collected by an appropriately licensed waste collection contractor and sent to an appropriate hazardous waste management facility for treatment and recycling in accordance with the Waste Management Regulations. Oil arisings will be managed as higher up in the waste hierarchy as technically and economically feasible and, therefore, are anticipated to be diverted from landfill disposal.	**Imperceptible**	Construction (temporary)
Hydrogeology	Potential to encounter residual contaminants that could become remobilised (decommissioning or demolishing plants handling coal)	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	Contaminated materials identified during site works will be subject to review and additional risk assessment and, if necessary, remediation and/or removal. All materials to be moved are to be classified according to Waste Management Act 1996 (as amended) and associated regulations and subject to a materials management plan set out in the RWMP.	**Imperceptible**	Construction (permanent and temporary)
	Numerous substances used on construction sites have the potential to pollute water if not properly managed and treated. Such substances include fuels, lubricants, cement, silt, and other substances which arise during construction. Accidents and disasters may result in the spillage or leakage of fuel or oil and pose a contamination risk. Groundwater provides a pathway to Shannon Estuary.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	Embedded mitigation such as the Demolition and Construction Environmental Management Plan (D&CEMP) to provide a framework of environmental protection measures that will be implemented prior to commencement of, and throughout the duration of, the proposed works. Use of Toolbox Talks and other daily H&S briefings. Environmental Incident Response Plan which will be followed and regularly reviewed throughout construction.	**Imperceptible**	Construction (permanent and temporary)
	Piling required to facilitate the construction of the stack / aux boiler house may temporarily mobilise contamination during installation	Magnitude of Impact: **Negative. Moderate Adverse**	The applied soil-bearing pressures for minor single storey buildings, auxiliary electrical skids and pumps are relatively low. Where feasible, shallow foundation solutions such as ground-	**Imperceptible**	Construction (temporary)

Receiving Environment	Construction Phase Impacts	Magnitude of impact, sensitivity, and effect	Avoidance and mitigation measures included in design	Post mitigation residual significance of effect	Duration of Effect
		Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	bearing shallow reinforced concrete pads, rafts and strip footings may be used instead of piling for these structures. Replacement piling techniques such as rotary bored or contiguous flight auger (CFA) will be employed. Rotary boring minimises soils drag down and lateral displacement of soil.		
	Groundwater is likely to be tidally influenced due to its proximity to the sea. Perched water may also be present in the made ground. Foundations (including piling) may act as a pathway for contamination or alter groundwater flow pathways. Groundwater provides a pathway to Shannon Estuary.	Magnitude and Quality of Impact: **Negative. Moderate Adverse.** Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	Embedded mitigation such as the Construction Environmental Management Plan (CEMP) to provide a framework of environmental protection measures that will be implemented prior to commencement of, and throughout the duration of, the proposed works. Where feasible, shallow foundation solutions such as ground-bearing shallow reinforced concrete pads, rafts and strip footings may be used instead of piling for these structures. Environmental Incident Response Plan which will be follow and regularly reviewed throughout construction.	**Imperceptible**	Construction (permanent)

12.5.3 Operation and Maintenance Phase

Operational phase effects considered include those which have the potential to impact the following receiving environments:

- Land and Land use
- Soils and Geology
- Hydrogeology

The assessment of operational phase, as outlined in Chapter 4, is summarised in the Table 12.13.

Table 12.13: Operational Phase Assessment of Effects

Receiving Environment	Operational Phase Impacts	Magnitude of impact, sensitivity, and effect	Avoidance and mitigation measures included in design	Post mitigation residual significance of effect	Duration of Effect
Land Use	No land use changes anticipated as a result of the proposed scheme.	Magnitude and Quality of Impact: **Negligible. Neutral** Receptor Sensitivity: **Medium** Significance of Effect: **Imperceptible**	None required	**Imperceptible**	Operational (long-term)
Soils and Geology	Potential leakage or spillage of HFO into the soil during operation. HFO poses risk of contamination to soil and subsoil. Contamination risk from spillage or leakage of HFO containing hydrocarbons, volatile & semi-volatile organic carbon and phenols.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate / Significant**	All storage tanks, containers, and drum storage areas that contain liquid material other than water to have leak containment bunds. In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities. There are no proposed increases of water treatment wastewater. Discharges on site will continue to be managed in accordance with the conditions of the site's IE licence.	**Imperceptible**	Operational (long-term)
	Accidental spillage can be a major source of pollution to the ground and groundwater.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate / Significant**	All chemicals stored on the site will be regulated under the IE licence. All fuels and chemicals stored on site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH.	**Imperceptible**	Operational (long-term)
	Disturbance and remobilisation of contaminants when removing existing ash from current designated cells within the Ash Storage Area (ASA) as well as the movement of landfilled ash and excavation of HFO bunds. Following the removal of existing ash, a liner will be installed, and the cell will be used for future storage of FGD by-product.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **High** Significance of Effect: **Moderate / Significant**	**Contaminated materials identified during site works will be subject to review and additional risk assessment and, if necessary, remediation and/or removal.** All materials to be moved are to be classified according to Waste Management Act 1996 (as amended) and associated regulations and subject to a materials management plan. For further information refer to Chapter 16 Material Assets and Waste and the accompanying RWMP.	**Imperceptible**	Construction (temporary)
Soils, Geology and Hydrogeology	Coal ash generated during coal combustion includes fly ash, bottom ash and sludge from flue gas desulfurization units. Coal ash is enriched in leachable trace elements such as arsenic, selenium, and boron that can be harmful to ecosystems near coal ash disposal sites.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **Medium to High** Significance of Effect: **Moderate**	Ash is stored in capped cells to prevent infiltration of rainwater. In the longer term ashes are to be disposed of via: 1. The ongoing operation of the HFO facility and will be consumed in power production at a rate averaging 3,000 hours per annum per unit.	**Imperceptible**	Operational (long-term)
	The main materials that may be required during the operational and maintenance phase will be diesel, propane and cement. The cement will be used in the FGD / ash capping layer. The dissolution and leaching of hydration products of cement can affect the pH value of groundwater. Concrete also contains chromium which has the potential to contaminate underlying soils, bedrock and groundwater.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity: **Medium to High** Significance of Effect: **Moderate**	All materials used are to be classified according to Waste Management Act 1996 (as amended) and associated regulations and subject to a materials management plan. For further information refer to Chapter 16 Material Assets and Waste and the accompanying RWMP. A chemical/physical analysis is presently ongoing to ensure HFO generated PFA/FGD by-product has similar physical and chemical properties of coal generated material. Periodic sampling and analysis is undertaken and the results submitted to the EPA as a condition of the IEL for their review and agreement.	**Imperceptible**	Operational (long-term)
Hydrogeology	Wastewater arising from operation (water treatment and process wastewater) has the potential to cause pollution if not appropriately managed, discharged or disposed of.	Magnitude of Impact: **Negative. Moderate Adverse** Receptor Sensitivity:	The only proposed changes to the process wastewater on site will be the boiler blowdown from the proposed auxiliary boiler house. It is proposed to connect this process water to the existing system which discharges to the Shannon Estuary at IEL	**Imperceptible**	Operational (long-term)

Receiving Environment	Operational Phase Impacts	Magnitude of impact, sensitivity, and effect	Avoidance and mitigation measures included in design	Post mitigation residual significance of effect	Duration of Effect
		Medium Significance of Effect: **Moderate**	emission point SW2. The process wastewater discharge limit will be limited, such that the overall discharge will not exceed the existing IEL flow limits of 25m^3/hr or 400m^3/day. In addition to this, current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2 will continue to be compiled with pH, mineral oil, suspended solids and ammonia. Discharges on site will continue to be managed in accordance with the conditions of the site's IE licence.		
	Contaminated runoff from roads, parking, concrete or bunded areas has the potential to cause contamination to ground or groundwater aquifer.	Magnitude of Impact: **Negligible. Small Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Slight**	Runoff will be managed and monitored in accordance with Industrial Emissions Licence (IEL).	**Imperceptible**	Operational (long-term)
	Site water discharges, e.g., firewater discharge, may contain contaminants that have the potential to pollute groundwater.	Magnitude of Impact: **Negligible. Small Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Slight**	A secure drainage system will prevent contamination migrating downwards to impact groundwater and will reduce infiltration from rainwater, reducing any potential for contamination to be mobilised. In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities.	**Imperceptible**	Operational (long-term)
	The proposed capping material may alter surface permeability and consequently surface water infiltration and recharge to the underlying aquifer.	Magnitude of Impact: **Negligible. Small Adverse** Receptor Sensitivity: **Medium** Significance of Effect: **Slight**	The proposed capping material has been tested and has similar properties and permeability as the existing blend. The ASA covers a minimal area in comparison to the larger aquifer – no anticipated effect on the groundwater flow regime.	**Imperceptible**	Operational (long-term)
	Dewatering may mobilise some contaminants associated with agricultural lands. Dewatering may also cause temporary changes in groundwater flows and levels. A lowered water table, caused by excessive abstraction, increases downward flow of water, with its accompanying soil suffusion, and can also remove or reduce buoyant support of soil and rock. It can induce clusters of new subsidence sinkholes across wide areas.	Magnitude and Quality of Impact: **Negative. Moderate Adverse.** Receptor Sensitivity: **Medium** Significance of Effect: **Moderate**	Due to the thin (or absent) superficial cover, groundwater is already subject to leachate infiltration. Given the limited volume of dewatering expected for groundwater control during temporary works, a regulatory permit should not be required. However, if the daily abstraction volume exceeds 25m^3, a dewatering / discharge permit should be obtained with specific mitigation measures relevant for the works.	**Imperceptible**	Operational (short-term)

12.5.4 Decommissioning Phase

The proposed development is expected to be operational using HFO as the primary fuel from 2025 to 2029. On cessation of activities, the plant will be decommissioned and remediated and restored in line with any requirements of the planning permission and IE licences, unless otherwise authorised.

On decommissioning the following steps will be implemented:

- All plant and equipment will be dismantled and either sold, recycled or disposed of through licensed waste contractors.
- All waste will be removed to a licenced facility by licenced waste contractors.
- Services will be disconnected.
- The sites will be left level.

A Decommissioning Management Plan (DMP) for the proposed development will be prepared in accordance with the IE licence application. This will include details of decommissioning of all plant and equipment with an Environmental Management Plan (EMP) in place to mitigate risks of environmental pollution.

Decommissioning the plant will require the removal of existing infrastructure. Once these sources of potential contamination have been removed, it is anticipated that there will limited potential impacts arising from contamination sources, however, this should be confirmed during a site investigation. Any decommissioning required will be subject to the conditions set out in the operating licence issued by the EPA.

12.6 Cumulative Effects

Cumulative effects are:

1. Those arising from impacts of the proposed development in combination with impacts of other proposed or consented development projects that are not yet built or operational; or
2. Those arising from intra-project interactions.

All EIARs are required to comply with EPA (Environmental Protection Agency, 2022) and Water Framework Directive guidelines. It is assumed that assessment, construction and embedded mitigation (such as the development of an appropriate CEMP) of a similar standard detailed herein would be incorporated into the below developments.

A list of projects located in the surroundings of the study area have been completed following a screening within 5km from the proposed development. The additional projects/developments considered with respect to cumulative effects on land, soils and hydrogeology are referenced in Section 5.5.9 of the EIAR.

The most significant adverse cumulative impacts are likely to be the cumulation of waste materials for export during site demolition/dismantling, which will be temporary in nature and subject to environmental management plans to mitigate risks of environmental pollution. Overall, requirements to identify and treat land contamination may improve ground conditions on the peninsula and lead to an overall slight beneficial effect.

12.7 Mitigation and Monitoring Measures

12.7.1 Design and Construction Best Practice Mitigation Measures

In addition to mitigation and monitoring measures below, refer to measures listed in Section 10.8.1.6 in Chapter 10 Biodiversity.

As detailed within the CEMP (Appendix C of this EIAR), the Environmental Clerks of Works (EnCoW) will be responsible for identifying any ground contamination during the construction phase. Surveys for visual or olfactory evidence of contamination will take place regularly during excavations and works will be stopped for further investigation if any evidence is encountered.

Any contaminated soils, sediment or groundwater that is encountered will be managed in accordance with best practice guidelines. Any contamination discovered during the construction will be assessed using a Contaminated Land Risk Assessment (CLRA). Where a significant risk to human health or controlled waters is identified the contamination will be remediated on-site or excavated, appropriately classified and disposed of as waste. Contamination management will comply with all relevant legislation and be undertaken in consultation with the EPA and any other relevant authorities as outlined in the CEMP in Appendix C.

Storage of contaminated material, if encountered on-site, will be avoided where possible. If storage on site is necessary, contaminated material will be strictly segregated into designated bunded areas where contaminants cannot leach into the underlying ground.

Asbestos Containing Material (ACM) will, if identified, be stored separately from other contaminated material to prevent mixing of asbestos with other contaminated materials.

If uncontaminated material is to be stored on site, consultation with the EPA will be undertaken prior to commencing storage, to ensure that any relevant authorisations are obtained and that spoil is managed, at all times, in accordance with all relevant legislation.

During construction the contractor will implement an environmental management plan which will set out control measures and procedures to ensure potentially polluting activities are controlled and managed. These measures will include, but are not limited to, the following:

- Fuel storage – bunded tanks to prevent spillages and designated fuelling areas with spillage control.
- Chemical storage – all potentially polluting chemicals will be stored in secure weatherproof enclosures with spill kits.
- Concrete washout will be established.
- Should dewatering be required any discharges will be treated to remove contaminants and silt and disposed of in accordance with EPA requirements.
- The site will be kept secure to prevent vandalism which can lead to pollution from stored liquids.
- Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations.
- The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Visual monitoring of the silt fence will be undertaken (regular and after significant rain). Silt fences will be repaired, replaced or reinforced as necessary to prevent migration of silt.

The CEMP will include emergency procedures to prevent adverse impacts in the event of a pollution event arising from accidents and disasters.

Routine monitoring of the site to ensure potentially contaminating activities remain under control. Monitoring will include daily visual monitoring of any surface water outfalls.

Prior to commencement of the development, the appointed Contractor will implement a construction Resource and Waste Management Plan (included as part of the CEMP) in accordance with the Best Practice Guidelines for the preparation of resource and waste management plans for construction and demolition projects (EPA, 2021). This will ensure that optimum levels of waste prevention, reduction, reuse, recycling and recovery are achieved

throughout the duration of the proposed development. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in a manner which will not adversely affect the environment. Wastewater will be disposed offsite in accordance with the Waste Management Act 1996, and associated regulations, in agreement with the EPA. Further details on the reuse of materials are provided within Chapter 16 Material Assets and Waste Management and the construction Resource and Waste Management Plan (Appendix C.1).

Prior to any works taking place ESB will undertake an inspection to identify the presence of all hazardous materials used in the construction of the structures and within the plant. Such materials can include; asbestos, refractory ceramic fibres, ozone depleting foams, Polychlorinated Biphenyls (PCBs) in transformer oils, etc. Where possible these will be removed prior to dismantling, however it is anticipated that there will be no hazardous insulating materials in the plant and structures to be demolished, as part of the dismantling works. The use of specialist contractors and the production of task specific method statements in line with relevant legislation and best practice will be implemented as per the CEMP (Appendix C) and the RWMP (Appendix C.1). Any unexpected ground contamination identified during the proposed works will be the subject of a remediation strategy which may entail additional monitoring.

12.7.2 Operational Phase Mitigation Measures

Operational risk mitigation measures have been designed into the Moneypoint Generating Station design (see Chapter 4 for further details). These include:

- Connecting process water from the proposed auxiliary boiler house to the existing system which discharges to the Shannon Estuary at IE Licence emission point SW2. This process water discharge will be limited such that the overall discharge will not exceed the existing IE Licence flow limits of 25m^3/hour or 400m^3/day. In addition to this, the current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2 will continue to be complied with (pH, mineral oil, suspended solids, and ammonia (as N)).
- In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities.
- It is also recommended that settlement ponds within the RLB are maintained during the operational phase to allow for the adequate settlement of suspended solids and sediments and prevent any deleterious matter from discharging (Inland Fisheries Ireland, 2023). Silt traps will be designed to minimise the movement of silt during intense precipitation events where the trap may become hydraulically overloaded.
- In the event of an accidental oil spill, the ESB Moneypoint Oil Spill Response Plan will be implemented which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills.
- Under the terms of Schedule C.6 of the site's IEL, groundwater monitoring is required from at least 30 monitoring wells across the site, plus any boreholes as may be determined under the Landfill Operational Plans. Quarterly monitoring of the wells listed above is required under the licence, with some parameters to be analysed/measured on a quarterly basis and others to be analysed on a biannual basis. Operational works will not interrupt quarterly groundwater monitoring.
- A network of gullies, aco channels (or similar) and surface water pipelines will be required to convey stormwater to the south of each bund. As with the existing surface water drainage system, discharge of the proposed surface water from the bund areas will be controlled by a

manually operated valve. The valve will, as is currently the case, be set to closed position and only opened following inspection in accordance with the IEL conditions to drain each bund. Operations will continue to comply with the IE licence.

- If dewatering is required and the daily abstraction volume exceeds 25m^3, a dewatering / discharge permit will be obtained with specific mitigation measures relevant for the works. Abstracted groundwater will be continuously monitored. Any contaminated groundwater will be treated to a suitable quality for discharge to surface water or tankered off site.

12.8 Residual Impacts

Following mitigation, the remaining component of an effect is considered a residual effect. Significance of residual effects is also determined using the criteria of Table 12.5.

Once mitigation measures are taken into account, the following residual impacts remain.

During the construction phase:

- The export of cut materials as waste will result in a slight adverse (permanent) effect that is not significant.
- Mitigation measures to manage and remediate (where appropriate) unexpected ground contamination will result in a slight beneficial (permanent) effect that is not significant.
- All other impacts to land and land, soils, geology and hydrogeology will result in negligible effects which are not significant.

During the operational phases:

- All impacts to land and land, soils, geology and hydrogeology will result in imperceptible effects which are not significant.

12.9 WFD Groundwater Impacts

A specific WFD screening has been conducted for the groundwater bodies identified by the WFD and intersected by the scheme working areas, following the EPA WFD groundwater quantitative status guidelines (Craig & Daly, 2010).

This screening determines whether the physical works require a further assessment to be compliant with the WFD. The groundwater screening assessment is summarised below in Table 12.14. Overall, the magnitude and the effects associated with the proposed development works relative to the scale of the WFD waterbodies are deemed to pose low risk to the delivery of long term WFD no deterioration and status objectives, such that no further (additional) assessment is required.

Table 12.14: WFD Groundwater Assessment

WFD Groundwater Body	Test	Impact Assessment
Kilrush (EU Code: IE_SH_G_123)	**Quantitative Status**	
	Saline (or other) intrusions	No further impact on saline intrusions anticipated due to the shallow nature of the scheme. Groundwater within the proposed development is already brackish in nature due the proximity to the coast.
	Impacts of groundwater on surface water ecological / quantitative status	No significant risks to surface water ecological/quantitative status. Existing pathway between groundwater and surface water is the shallow aquifer and the Shannon Estuary. Due the mitigation in place no significant impacts are anticipated to either recharge or water quality in the shallow aquifer. Hence, the remaining risk to SW is low from a contamination perspective.
	Groundwater Dependent Terrestrial Ecosystem (GWDTE) quantitative status	The Kilrush WFD Groundwater bodies has been designated in entirety as protected areas for Groundwater in SPA/SAC habitats (see Section 12.4.3.5). However, the closest SPA/SAC areas to the scheme are estuarine/marine related habitats, which are not considered GWDTEs. Therefore, no GWDTEs have been identified within these groundwater bodies.
	Water balance	Although dewatering is not anticipated to be required during excavation works, adverse weather and/ or unexpected ground conditions may result in the need to dewater. Given the limited volume of dewatering expected for groundwater control during temporary works, a regulatory permit should not be required. However, if the daily abstraction volume exceeds 25 m^3, a dewatering / discharge permit will be obtained with specific mitigation measures relevant for the works. Any discharges will be treated to remove contaminants and silt and disposed of in accordance with EPA requirements. The proposed development will not change surface permeability from the existing case and therefore the recharge regime is not expected to change. The scale of the site is negligible compared to the WFD groundwater body. Therefore, the temporary and permanent impact to water balance of the WFD groundwater bodies is expected to be negligible.
	Chemical Status	
	Saline (or other) intrusions	No further impact on saline intrusions anticipated due to the shallow nature of the scheme. Groundwater within the proposed development is already brackish in nature due the proximity to the coast.
	Impacts of groundwater on surface water ecological / chemical status	No predicted impact to water balance of the WFD groundwater body. The bedrock aquifer is likely to receive limited recharge due to the low-permeability urban cap overlying the aquifer. In addition to this, the water resource potential of the aquifer is likely to be low due to the proximity to the coast as well as the historical land use of the area. Measures are in place to minimise the risk of contamination migration during piling. The proposed development will not change surface permeability. Therefore, there are not expected to be any permanent impacts to the wider WFD surface water body.
	GWDTE chemical status	The Kilrush WFD Groundwater bodies has been designated in entirety as protected areas for Groundwater in SPA/SAC habitats (see Section 12.4.3.5). However, the closest SPA/SAC areas to the scheme are estuarine/marine related habitats, which are not considered GWDTEs. Therefore, no GWDTEs have been identified within these groundwater bodies.
	Drinking water protected areas	All Water Framework Directive (WFD) groundwater bodies have been identified in Catchments.ie as Drinking Water Protected Areas.

WFD Groundwater Body	Test	Impact Assessment
		However, there are no designated public supply or group scheme source protection areas within 10km of the scheme and therefore the impact of this scheme to drinking water supplies is considered negligible.
	General chemical assessment	The risk of accidental spills and leaks of contaminants will be minimised by standard groundwater protection measures implemented during construction. Due to the thin (or absent) superficial cover, groundwater is already subject to leachate infiltration. The impact to the chemical status of WFD groundwater body is considered negligible.

13 Archaeology, Architecture and Cultural Heritage

13.1 Introduction

This chapter of the EIAR, prepared by Rubicon Heritage Services Ltd., details the archaeological, architectural and cultural heritage issues that need to be addressed in respect of the development as described in Chapter 4 of this EIAR.

This study aims to assess the baseline archaeology and cultural heritage environment, to evaluate the likely impacts that the proposed development will have on this environment, and to provide mitigation measures to avoid, reduce or offset these effects in accordance with the policies of the Department of Housing, Local Government and Heritage (DoHLGH 2004; 2011; 2018), the Clare County Council Development Plan 2023-2029, the National Monuments Acts 1930-2014, (as amended) (Government of Ireland, 1930) and best practice guidelines.

13.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Archaeology, Architectural and Cultural Heritage chapter are set out in this section.

13.2.1 Legislation and Policies

The following policy and guidance documents have been used to inform this chapter of the EIAR:

- Planning and Development Act 2000 (as amended)
- National Monuments Acts 1930-2014 (as amended)
- Clare County Development Plan 2023-2029

13.2.2 Guidelines

The scope and methodology for the baseline assessment has been devised in consideration of the following guidelines:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (Environmental Protection Agency, 2022)
- Frameworks and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands (DAHGI), 1999)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)
- Architectural Heritage Guidelines (Department of the Environment, Heritage and Local Government, 2004)
- Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (National Roads Authority, 2005)
- Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (National Roads Authority, 2005)
- Cultural Heritage Impact Assessment (CHIA) of TII Projects Draft (Transport Infrastructure Ireland, 2022)

- EirGrid (2015) Cultural Heritage Guidelines for Electricity Transmission Projects. A stand approach to archaeological, architectural and cultural heritage impact assessment of high voltage transmission projects

13.3 Methodology

13.3.1 Approach to Data Collection

13.3.1.1 Desktop Study

This assessment of the archaeological, architectural and cultural heritage of the proposed development area is based on a desktop study of a number of documentary and cartographic sources. The desktop study was further augmented by an examination of aerial photography as well as a field survey. The main sources consulted in completing the desktop study are listed in Table 13.1.

Table 13.1: Data Sources used to inform the archaeological, architectural and cultural heritage chapter of this EIAR

Data source	Date Accessed	Data contents
The Sites and Monuments Record database on Archaeology of Ireland Historic Viewer	November 2023	Sites and Monuments Record (SMR) and Record of Monument and Places (RMP) for County Clare
National Inventory of Architectural of Heritage	November 2023	Registered Architectural sites
Excavation Bulletins database (www.excavations.ie)	November 2023	Past Excavation Reports
Clare County Council Development Plan	November 2023	Record of Protected Structures, Architectural Conservation Areas
Clare Coastal Architectural Heritage Survey	November 2023	Coastal structures and stone roofed buildings
Various editions of the Ordnance Survey of Ireland maps	November 2023	Undesignated archaeological and architectural sites (e.g. townland boundaries, vernacular settlement)
Ordnance Survey Name books and Letters	November 2023	Historical data, archaeological data
Various published sources for local history	November 2023	Historical data, archaeological data
Aerial Photographs (OSI, Google Earth archive)	November 2023	*In situ* monuments, unknown monuments
Cartographic Sources	November 2023	Undesignated archaeological and architectural sites

13.3.1.2 Field Inspection

A field inspection of the proposed development site was undertaken by Rubicon Heritage Services Ltd on 14 September 2023.

The primary purpose of a field inspection is to assess local topography in order to identify any potential low-visibility archaeological and/or historical sites that are not currently recorded and which may be impacted upon negatively by the proposed development. It is also the purpose of the field inspection to survey any known monuments or sites and to consider the relationship between them and the surrounding landscape, all of which need to be considered during the assessment process.

The methodology used during the field inspection involved recording the present land use as well as the existing topography for the entire area comprising the proposed development. A photographic record and written description were compiled for any known and/or potential sites

of archaeological, architectural and/or cultural significance. In addition, a Global Positioning System (GPS) waypoint was taken for each identified site of said significance.

13.3.2 Study Area

The study area for this assessment has been defined in respect of two factors:

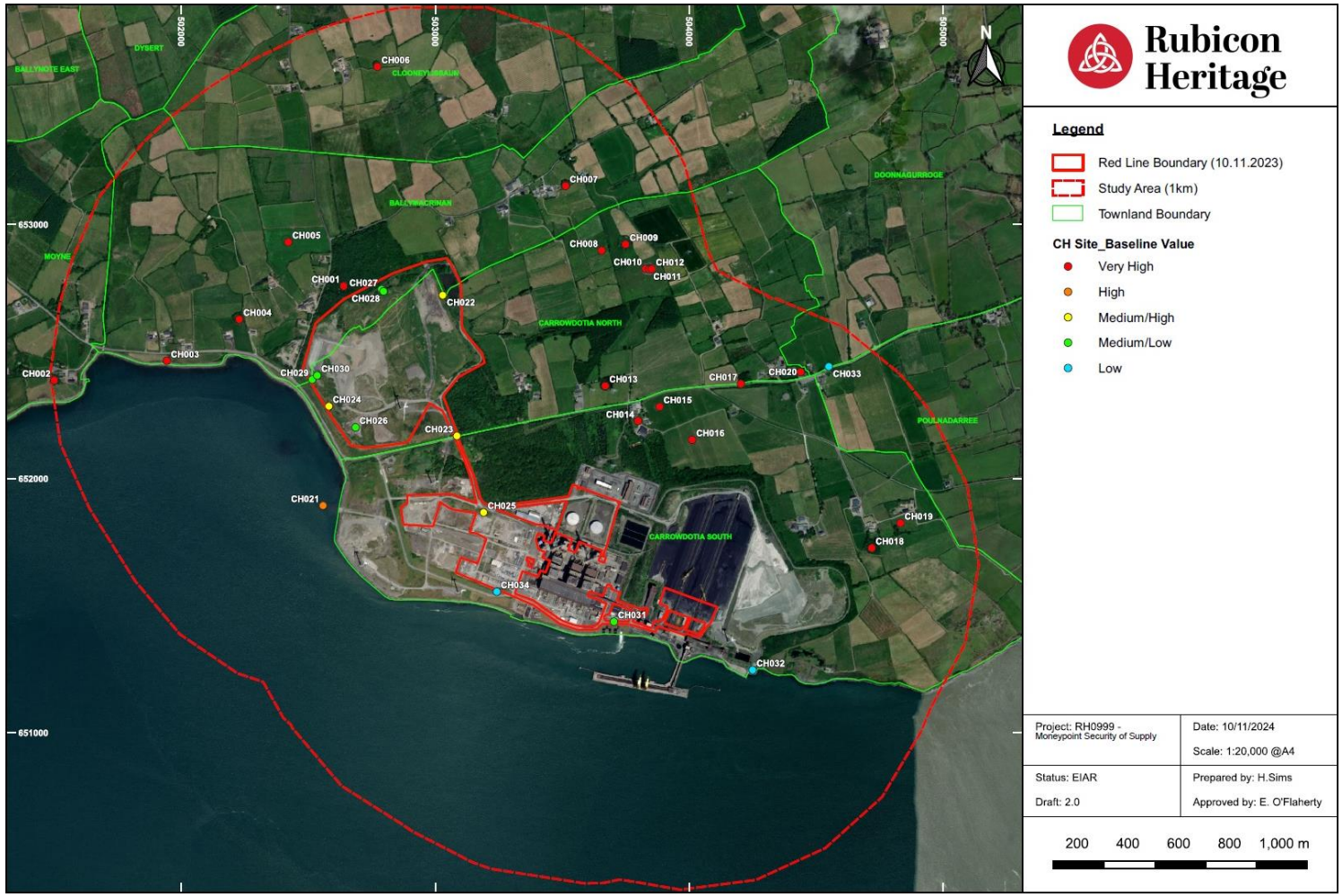
- the ability of sites/information sources to provide information pertaining to the archaeological potential of the proposed development site; and
- the potential physical impact, as well as impact on setting, that the proposed works may have on sites of cultural heritage significance.

Taking these factors into account the study area has been defined as per Table 13.2. The study area is shown in Figure 13.1.

Table 13.2: Dimensions of the Study Area

Subject	Study Area
National Monuments and Recorded archaeological monuments (RMPs)	Within 1km of the proposed development
Protected Structures and/or their curtilage	Within 1km of the proposed development
Architectural Conservation Areas (ACAS)	Within 1km of the proposed development
Structures recorded in the National Inventory of Architectural Heritage	Within 1km of the proposed development
Unregistered features of cultural heritage	Within the proposed development site
Areas of archaeological potential	Within the proposed development site
Previous excavations	Within the townlands crossed by the proposed development

Figure 13.1: Architectural, Archaeological and Cultural Heritage Sites



Source: Rubicon Heritage, 2024

13.3.3 Approach to Impact Assessment

13.3.3.1 Methodology Used for Assessing Baseline Value of Sites

In order to categorise the baseline environment in a systemised manner, 'baseline values' have been assigned to each identified and/or potential site of cultural heritage significance within the study area. The baseline value of a site is determined with reference to the 'importance' and 'sensitivity' of the site.

In accordance with guidelines (Transport Infrastructure Ireland, 2022; 2005), the importance of a site is determined based on the following criteria: legal status, condition, historical associations, amenity value, ritual value, specimen value, group value and rarity. The sensitivity of a site is determined based on its susceptibility to physical impact, as well as susceptibility to impact on setting.

It should be noted that the National Monuments Act 1930-2014 (as amended) (Government of Ireland, 1930) does not differentiate between recorded archaeological sites on the basis of relative importance or sensitivity. In addition, the Planning and Development Act 2000 (as amended) (Government of Ireland, 2000) does not differentiate between Protected Structures or Areas of Architectural Conservation on the basis of relative importance or sensitivity either. Consequently, professional judgement has been exercised to rate these features based on their perceived importance and sensitivity in relation to physical impacts and impacts on setting.

Taking the above factors into consideration, the criteria that have been defined are provided in Table 13.3.

Table 13.3: Baseline Values of Sites

Subject	Baseline Value
• Recorded Archaeological Monuments • Protected Structures • Architectural Conservation Areas (ACAs) • Shipwrecks known to be more than 100 years old or whose date is uncertain	Very High
• Sites listed in the NIAH that are not Protected Structures • Shipwrecks that are known to be less than 100 years old • Unregistered built heritage sites that comprise extant remains which are in good condition and/or which are regarded as constituting significant cultural heritage features • Unrecorded features of archaeological potential and Areas of Archaeological Potential based on topographical indicators	High
• Unregistered cultural heritage sites (not including built heritage sites) that comprise extant remains • Townland boundaries that comprise extant remains	Medium/High
• Unregistered cultural heritage sites for which there are no extant remains but where there is potential for associated subsurface evidence • Townland boundaries for which there are no extant remains	Medium/Low
• Unregistered cultural heritage sites for which there are no extant remains and where there is little or no potential for associated subsurface evidence	Low

13.3.3.2 Type of Impact

The following Table 13.4 lists the type of impacts that a proposed development may have on the cultural heritage resource.

Table 13.4: Types of Impact

Types of Impact	Definition
Direct	Direct impacts arise where an archaeological, architectural and/or cultural heritage feature or site is physically located within the footprint of the proposed development, or its associated physical impact zone, whereby the removal of part, or all of the feature or site is thus required.
Indirect	Indirect impacts arise when an archaeological, architectural or cultural heritage feature is not located within the footprint of the proposed development, or its associated physical impact zone, and thus is not impacted directly. Such an impact could include impact on setting or impact on the zone of archaeological potential of site whereby the actual site itself is not physically affected.
Cumulative	The addition of many impacts to create a large, significant impact.
Undeterminable	Whereby the full consequence that the proposed development may have on the cultural heritage resource is not known.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

13.3.3.3 Assessing Impacts on Setting

The definition of setting follows the guidance set by Historic England, as they have developed a range of comprehensive guidance on this subject specific to heritage assets (Historic England 2008; 2017). Hence setting is not simply the visual envelope of the asset in question. Rather, it is those parts of the asset's surroundings that are relevant to the significance of the asset and the appreciation thereof, and in which a heritage asset is experienced.

In most instances setting will relate to the historical value of the asset, where an appreciable relationship between the asset and an element of its surroundings helps the visitor understand and appreciate the asset. This may be in terms of a physical relationship, such as between a castle and the natural rise that it occupies, or a more distant visual relationship, such as a designed vista or the view from, for example, one ringfort to another. The former is referred to as immediate setting and the latter as landscape setting. Many assets will only have an immediate setting. Some assets will have aesthetic value that relates to the surrounding landscape, such as in the case of a designed view incorporating a distant hill, or that relates to the contribution the asset makes to the local landscape, for example a church spire providing a focal point in a view down a valley.

Historic England has provided a list of factors to be considered when assessing impacts upon setting. These are broad factors and have been taken into consideration when assessing magnitude of impact and sensitivity. They are summarised in Table 13.5.

Table 13.5: Factors to be Considered when Assessing Impacts upon Setting (adapted from Historic England, 2017)

Factor	Discussion
Visual dominance	Where an historic feature (such as a hilltop monument or fortification, a church spire, or a plantation belonging to a designed landscape) is the most visually dominant feature in the surrounding landscape, adjacent construction of the proposed development may be inappropriate.
Scale	The extent of a proposed development and the number, density and disposition of its associated elements will also contribute to its visual impact.
Intervisibility	Certain archaeological or historic landscape features were intended to be seen from other historic sites. Construction of a proposed development should respect this intervisibility.
Vistas and sight-lines	Designed landscapes invariably involve key vistas, prospects, panoramas and sight-lines, or the use of topography to add drama. Location of a proposed development within key views, which may often extend beyond any designated area, should be avoided.

Movement, sound or light impacts	The movement associated with a proposed development may be a significant issue in certain historic settings. Adequate distance should always be provided between important historic sites and proposed developments to avoid the site being overshadowed or affected by noise.
Unaltered settings	The setting of some historic sites may be little changed from the period when the site was first constructed, used or abandoned. Largely unaltered settings for certain types of sites, particularly more ancient sites, may be rare survivals and especially vulnerable to modern intrusions such as wind turbines. This may be a particular issue in certain upland areas.

The following are guides to the assessment of magnitude of impact on setting:

- *Obstruction of or distraction from key views*: Some assets have been sited or designed with specific views in mind, such as the view from a country house with designed vistas. The obstruction or cluttering of such views would reduce the extent to which the asset could be understood and appreciated by the visitor. Developments outside key views may distract from them and make them difficult to appreciate on account of their prominence and movement. In such instances the magnitude is likely to be greatest where views have a particular focus or a strong aesthetic character. Sympathetic development may improve key views by removing features that obstruct or distract from key views and hence preserve or enhance the importance of the asset.
- *Changes in prominence*: Some assets are deliberately placed in prominent locations in order to be prominent in the surrounding landscape, for example prehistoric cairns are often placed to be silhouetted against the sky and churches in some areas are deliberately placed on ridges in order to be highly visible. Developments can reduce such prominence and therefore reduce the extent to which such sites can be appreciated or the contribution that they make to the local landscape. Similarly, sympathetic development can enhance the setting of such sites by, for example, removing modern forestry that would otherwise compromise the setting of a cairn that had been placed on a skyline.
- *Changes in landscape character*: A particular land use regime may be essential to the appreciation of an asset's function, for instance the fields surrounding an Improvement period farmstead are inextricably linked to its appreciation. Changes in land use can leave the asset isolated and reduce its value. In some instances, assets will have aesthetic value or a sense of place that is tied to the surrounding landscape character. Conversely, sympathetic development may restore or preserve the relevant land use and hence preserve or enhance the relevant value of the asset.
- *Duration of impact*: Impacts that are long term or permanent are generally of greater magnitude than those that are short term.

Readily reversible impacts are generally of lesser magnitude than those that cannot be reversed. Impacts upon the defined setting will be of greater magnitude than those that affect unrelated elements of the asset's surroundings or incidental views to or from an asset that are unrelated to the appreciation of its value. The magnitude of impacts can be rated from Negligible to Major using a similar scale to that for physical impacts.

13.3.3.4 Methodology Used for Assessing Significance Level of Impacts

The methodology used to assess the magnitude of potential pre-mitigation impacts, as well as residual impacts, of the proposed development on the baseline environment is presented in Tables 13.6, 13.7 and 13.8.

The significance level of a construction or operation impact on a feature is assessed by combining the magnitude of the impact and baseline value of the feature. The matrix in Table 13.8 provides a guide to decision-making, but it is not a substitute for professional judgement and interpretation, particularly where the baseline value or impact magnitude levels are not clear or are borderline between categories.

The permanence of the effects is also taken into account, with irreversible effects being more significant while temporary or reversible changes are likely to be less significant.

The levels of impact for architectural heritage used was based on the levels set out and having regard to the EPA Guidance and are defined in the TII Guidelines as follows:

Table 13.6: Criteria used for Rating Magnitude of Negative Impacts

Impact Magnitude	Criteria
Profound	● Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where an archaeology site is completely and irreversibly destroyed. ● An impact that obliterates the architectural heritage of a structure or feature of national or international importance. These effects arise where an architectural structure or feature is completely and irreversibly destroyed by the proposed scheme. Mitigation is unlikely to remove adverse effects.
Significant	● An impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about an archaeological feature/site. ● An impact that by its magnitude, duration or intensity alters the character and/or the setting of the architectural heritage. These effects arise where an aspect or aspects of the architectural heritage is/are permanently impacted upon leading to a loss of character and integrity in the architectural structure or feature. Appropriate mitigation measures are likely to reduce the impact. ● A beneficial or positive effect that permanently enhances or restores the character and/or setting of a feature of archaeological or cultural heritage significance in a clearly noticeable manner.
Moderate	● A medium impact arises where a change to a site/monument is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised, and which is reversible. This arises where an archaeological feature can be incorporated into a modern-day development without damage and that all procedures used to facilitate this are reversible. ● A medium impact to a site/monument may also arise when a site is fully or partly excavated under license and all recovered data is preserved by record. ● An impact that results in a change to the architectural heritage which, although noticeable is not such that alters the integrity of the heritage. The change is likely to be consistent with existing and emerging trends. Impacts are probably reversible and may be of relatively short duration. Appropriate mitigation measures are very likely to reduce the impact. ● A beneficial or positive effect that results in partial or temporary enhancement of the character and/or setting of a feature of archaeological or cultural heritage significance in a clearly noticeable manner.
Slight	● An impact which causes changes in the character of the environment, such as visual impact, which are not high or very high and do not directly impact or affect an archaeological feature or monument. ● An impact that causes some minor change in the character of architectural heritage of local or regional importance without affecting its integrity or sensitivities. Although noticeable, the effects do not directly impact on the architectural structure or feature. Impacts are reversible and of relatively short duration. Appropriate mitigation measures will reduce the impact. ● A beneficial or positive effect that causes some minor or temporary enhancement of the character of an architectural heritage significance which, although positive, is unlikely to be readily noticeable.
Not Significant	● An impact on archaeological features or monument capable of measurement but without noticeable consequences. ● An impact on architectural heritage of local importance that is capable of measure merit but without noticeable consequences.
Imperceptible	● An impact on archaeological features or monument not measurable and has no noticeable consequences. ● An impact on architectural heritage of local importance that is not measurable and has no noticeable consequences.

Table 13.7: Criteria used for Rating Magnitude of Positive Impacts

Impact Magnitude	Criteria
Significant positive:	● a beneficial effect that permanently enhances or restores the character and/ or setting of the architectural heritage in a clearly noticeable manner;
Moderate positive:	● a beneficial effect that results in partial or temporary enhancement of the character and/ or setting of the architectural heritage and which is noticeable and consistent with existing and emerging trends;
Slight positive:	● a beneficial effect that causes some minor or temporary enhancement of the character of architectural heritage or local or regional importance which, although positive, is unlikely to be readily noticeable; and
Imperceptible positive:	● a beneficial effect on architectural heritage of local importance that is capable of measurement but without noticeable consequences.

Source: EPA, 2022

Table 13.8: Criteria for Assessing Significance Level of Negative Impacts

Magnitude of Impact	Baseline Value				
	Very High	High	Medium / High	Medium / Low	Low
Profound	Profound negative	Significant negative	Moderate negative	Slight negative	Imperceptible negative
Significant	Significant negative	Significant negative	Moderate negative	Slight negative	Slight negative
Moderate	Moderate negative	Moderate negative	Slight negative	Slight negative	Imperceptible negative
Slight	Moderate negative	Slight negative	Slight negative	Imperceptible negative	Imperceptible negative
Not significant	Slight negative	Slight negative	Imperceptible negative	Imperceptible negative	Imperceptible negative
Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible

Source: EPA, 2022

13.3.4 Limitations of this EIAR

There were no significant limitations or restrictions encountered during the compilation of this chapter of the EIAR. All third-party reports, data and mapping were reviewed and are understood to be correct for the purposes of this chapter.

13.4 Receiving Environment

13.4.1 Topography and Landscape

The proposed development site is situated in the townlands of Carrowdotia North, Carrowdotia South and Ballymacrinan, in the parish of Killimer, on the northern shore of Lower Shannon Estuary in Co. Clare (see Plates 1 to 20 in Appendix J). The development area comprises the existing Moneypoint Generating Station complex which includes the Ash Storage Area (located to the northwest of the main complex), set in a wider landscape of undulating lands that are largely given over to pastural farming. The main soil associations comprise fine loamy drift with siliceous stones, and occasional peat deposits.

13.4.2 Archaeological and Historical Context

13.4.2.1 Prehistoric Period

There is very little recorded evidence of prehistoric activity occurring within 1km of the proposed development site (see Figure 13.1). However, archaeological intertidal surveys along the wider Shannon Estuary environment have shown evidence of human activity since the prehistoric period (O'Sullivan and Breen 2007,17).

The importance of the Shannon Estuary and River as a major maritime/riverine routeway into the heart of Ireland, and also as an important economic resource, is well attested. From the earliest times, coastal communities availed of and exploited the salt and freshwater estuarine, creeks, corcass, mudflats, reed beds and its feeder estuaries of the Deel and Maigue rivers on the southern estuary shore, and The Fergus on the northern shore, as well as a myriad of other minor rivers and streams to access and positively exploit these immensely important resources. Dispersed rural settlement sites for these communities were established on the wooded hills and terraces on both sides of the estuary. Fishing was of immense importance, the evidence for which includes many weirs made of rows of wooden stakes and wattling driven into the estuarine foreshore to create linear fish traps of varying forms and dating from all periods. The weirs are preserved in the deep alluvium that creates an anaerobic or anoxic environment.

Research conducted along the Shannon Estuary in the 1990s (O'Sullivan, 2001) highlighted the archaeological importance of these waters since earliest times. Work conducted by O'Sullivan's Discovery Programme focused attention on the role that the estuary played in providing economic potential in terms of coastal exploitation for fishing and communications since the later Mesolithic period, before people exploited the landscape directly for agrarian production.

O'Sullivan's (2001) study area focused on the intertidal mudflats on the Fergus and Meelick rivers and around Carrigdirty, County Limerick. Estuarine environments are sensitive to sea-level change and large areas of prehistoric foreshore have been submerged by relatively small fluctuations in that level in the past. This inter-tidal environment often provided an extremely rich archaeological record, preserving archaeological and paleoenvironmental evidence of Mesolithic, Neolithic, Bronze Age and post-medieval dates. Large sections of the estuary provide suitable environmental conditions for the preservation of archaeological material along its intertidal zone, where deep deposits of estuarine mud provide an anaerobic environment within which archaeological material is preserved. Areas of submerged Neolithic forest have been identified, buried deep within the estuarine clays. The distribution of known medieval and early modern/19th century fortifications along the estuary was well known, but the work of O'Sullivan highlighted the as-yet undocumented foreshore areas with relict fish weirs and old piers as features that can retain significant and early phases of use.

13.4.2.2 Medieval Period (AD 400–1540)

There is greater evidence of early medieval settlement within the vicinity of the proposed development. The early medieval period (AD 400 – c. 1169) was a time of rapid expansion of agriculture. Throughout this period, Ireland was a predominantly rural society characterised by dispersed settlement. The economy was based on mixed agriculture, though the rearing of cattle was seen as very important. Ringforts and enclosures are indicative of settlement at this time.

Ringforts and cashels are the most numerous and characteristic monument in the Irish landscape, with some 45,000 examples recorded (Stout 1997, 53). Ringforts were formerly known as *rath* or *lios*, which still form the part of many placenames in the countryside. The ringfort or rath is basically a circular or roughly circular area enclosed by an earthen bank formed of material thrown up from concentric fosse (ditch) on its outside. Generally, the diameter of the enclosure is between 25m and 50m. A single bank and fosse (univallate) is the

most usual form; double rings (bivallate) or triple rings (trivallate) are rarer. The number of rings of defence are thought to reflect on the status of the site, rather than the strengthening of its defences (Power 1992, 131). Cashels are the stone version of the earthen ringforts and are enclosed by a drystone wall (Edwards 1990, 14).

Archaeological excavation has shown that the majority of ringforts were enclosed farmsteads, built in the early medieval period. Though not forts in the military sense, the earthworks acted as a defence against natural predators like wolves, as well as against enemies. Local warfare and cattle raiding were commonplace at this time. The construction of so many throughout the country, in a relatively short period (c. 400–500 years), reflects on the stability and wealth of society at the time, and also its homogeneity. As well as farming-related activities like corn-grinding and animal husbandry, the ringfort was home to a wide variety of craft industries, including spinning, weaving, metal- and glass-working. Dwellings and outhouses were built on timber posts, with walls of wattle, mud or sods, which usually leave no trace above ground today. Excavation can trace the remains of these structures by revealing features like post-holes, stake-holes and sunken hearths. The favoured locations for ringforts are on the shoulder of ridges or at breaks of slopes. Many have level interiors created by scarping-up on the downslope and cutting into the upslope. The enclosing element can change dramatically from a downslope scarped edge to a well-defined bank and fosse on the upslope. Thus sited, they are often overlooked close-in on one side but otherwise command an extensive view (Power 1992, 131).

There is a single cashel (CL067-039001-) and 13 no. ringfort/enclosure sites located within 1km of the proposed development (CL067-026----, CL067-033--- CL067-034----,CL067-036----, CL067-037----, CL067-038----, CL067-040----, CL067-041----, CL067-042----, CL067-043----, CL067-045----, CL067-050----, CL067-051----; CL067-067----).

There is also a souterrain (CL067-039002-) located within 1km of the proposed development. Souterrains are artificially made underground or semi-subterranean passages and chambers. They are frequently found within ringforts, although they can be found with other monuments, or on their own (Edwards 1990, 29). In this case, the souterrain is located within the cashel (CL067-039001). There is also a recorded hut site (CL067-039003) within the same cashel.

13.4.2.3 Early Modern Period (AD 1700–1850)

Early modern activity within the vicinity of the development is indicated by quarrying at Moneypoint. This is recorded by Lewis (1837) in his *Topographical dictionary of Ireland.'* Lewis (*ibid.*, 146) notes that there were 'flags of superior quality are quarried at Money-point'. The quarry mentioned is marked on the First Edition 6-inch and 25-inch Ordnance Survey maps 0.48km northwest of the limit of the proposed development site, in the townland of Ballymacrinan. Other evidence of activity and vernacular settlement through the early modern period includes a boat slipway (CH021) which was built around 1852 to accommodate barges entering Moneypoint with coal supplies (Halpin & O'Connor 2007, 170).

13.4.2.4 Moneypoint Generating Station

In the late 1970s, the Moneypoint site was acquired by the ESB to develop a coal fired power plant (ESB International 2011, 2.2). The power station was commissioned between September 1985 and June 1987 (ESB, 2024). The power station has played an important role in industrial heritage of the Shannon estuary, providing employment and contributing to the Irish economy. The power station is a centre of activity on the Shannon estuary. Today, like in the 19th century, boats bring coal supplies to the station. The station can accept vessels up to 250,000dwt (Clare County Council 2013, 21). The construction of Moneypoint also had a significant impact on the surrounding landscape. The topography of the site was changed, and 24ha of new land was created from rock excavated from the coal yard (ESB International 2011, 15.1).

Moneypoint Generating Station also has a significant place in Irish history. During the 1970s, Ireland had suffered as a result of the international oil crisis, and the need to diversify Ireland's energy supply was highlighted (ESB, 1985; ESB, 2024). Moneypoint Generating Station was built to both reduce Ireland's reliance on imported Heavy Fuel Oil (HFO) and to meet the increasing demand for electricity (ESB, 2024). Coal was thought to be suitable alternative due to what was seen as the abundant available coal resources around the world (ESB, 1985).

13.4.3 Designated Archaeological Sites

13.4.3.1 Record of Monuments and Places (RMPs)

Section 12 (1) of the National Monuments Act 1930-2014 (as amended) (Government of Ireland, 1930) made provision for the establishment and maintenance of a Record of Monuments and Places (RMP). Under this Act, each site recorded in the Record of Monuments and Places is granted statutory protection. When the owner or occupier of a property, or any other person proposes to carry out, or to cause, or to permit the carrying out of any work at or in relation to a recorded archaeological monument they are required to give notice in writing to the Minister for Housing, Local Government and Heritage two months before commencing that work.

There are no RMP's within the proposed development application boundary. There are 19 no. RMPs located within 1km of the proposed development. One RMP (CH001; an Earthwork) is situated 70m northwest of the application boundary for the proposed development in the townland of Ballymacrinan.

The development boundary does not cross the Statutory Zone of Notification for CH001. CH001 is situated in scrubland/woodlands and is not visible from the proposed development site. The zones do not define the exact extent of the monuments, but rather are intended to identify them for the purposes of notification under Section 12 of the National Monuments Act (1930-2004): each is referred to as a "zone of notification". If it is intended to carry out works within a Zone of Notification, two months prior notice in writing must be provided to the Minister for Minister for Housing, Local Government and Heritage, even if planning permission is not needed for the works. Works undertaken through the planning process is via a formal notification mechanism and acts as notification in accordance with Section 12 of the National Monuments Act.

Table 13.9: Record of Monuments and Places (RMPs) located within the Study Area

CH ID	Type	RMP No;	Short Description	Townland
CH001	RMP	CL067-035----	Earthwork	Ballymacrinan
CH002	RMP	CL067-026----	Rath	Moyne
CH003	RMP	CL067-030----	Earthwork	Ballymacrinan/Carrowdotia North
CH004	RMP	CL067-033----	Rath	Ballymacrinan/Carrowdotia North
CH005	RMP	CL067-034----	Rath	Ballymacrinan
CH006	RMP	CL067-036----	Rath	Clooneylissaun
CH007	RMP	CL067-037----	Rath	Ballymacrinan
CH008	RMP	CL067-067----	Enclosure	Carrowdotia North
CH009	RMP	CL067-038----	Rath	Carrowdotia North
CH010	RMP	CL067-039002-	Souterrain	Carrowdotia North
CH011	RMP	CL067-039001-	Cashel	Carrowdotia North
CH012	RMP	CL067-039003-	Hut Site	Carrowdotia North
CH013	RMP	CL067-040----	Rath	Carrowdotia North

CH ID	Type	RMP No;	Short Description	Townland
CH014	RMP	CL067-041----	Rath	Carrowdotia South
CH015	RMP	CL067-042----	Rath	Carrowdotia South
CH016	RMP	CL067-043----	Rath	Carrowdotia South
CH017	RMP	CL067-045----	Rath	Carrowdotia North
CH018	RMP	CL067-050----	Rath	Carrowdotia South
CH019	RMP	CL067-051----	Rath	Carrowdotia South

13.4.3.2 National Monuments

National Monuments are broken into two categories: National Monuments in the ownership or guardianship of the state and National Monuments in the ownership or guardianship of a local authority. Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which, are considered to be of national importance. Two months' notice must be given to the Minister for Housing, Local Government and Heritage where work is proposed to be carried out at or in relation to any National Monument.

No National Monuments sites occur within the study area.

13.4.3.3 Sites with Preservation Orders

The National Monuments Act 1930-2014 (as amended) (Government of Ireland, 1930) provide for the making of Preservation Orders and Temporary Preservation Orders in respect of National Monuments. Under Section 8 of the National Monument Act 1930 (as amended) the Minister for Housing, Local Government and Heritage, can place a Preservation Order on a monument if, in the Minister's opinion, it is a National Monument in danger of being or is actually being destroyed, injured or removed or is falling into decay through neglect.

The Preservation Order ensures that the monument shall be safeguarded from destruction, alteration, injury, or removal, by any person or persons without the written consent of the Minister.

There are no sites with preservation orders incorporated by the study area.

13.4.3.4 Record of Protected Structures

The Clare County Development Plan 2023–2029 (Clare County Council, 2023) was consulted for schedules of Protected Structures. These are buildings that a planning authority considers to be of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social, and/or technical point of view.

Protected Structures receive statutory protection from injury or demolition under Section 57 (1) of the Planning and Development Act 2000 (as amended) (Government of Ireland, 2000). Protected structure status does not exclude development or alteration but requires the developer to consult with the relevant planning authority to ensure that elements which make the structure significant are not lost during development. If a structure is included in the RPS, the protection extends to:

- The interior of the structure
- The land in its curtilage. Curtilage means the land and outbuildings immediately surrounding a structure which is (or was) used for the purposes of the structure.
- Any other structures on that land and their interiors.

- All fixtures and features forming part of the interior and exterior of the protected structure or any structure on the grounds attached to it.

Inclusion of these structures in the Record of Protected Structures (Volume 4 of the Clare County Development Plan 2023-2029) means that their importance is recognised, they are legally protected from harm and all future changes to the structure are controlled and managed through the development control process (for example, planning permission) or by issuing a declaration under Section 57 of the Planning and Development Act 2000 (as amended).

There is one Protected Structures located within the study area. This is St. Senan's/St. Imy's church (CH020), which is a 19th century Catholic church. It is located approximately 890m northeast of the application site boundary. This Protected Structure is also included on the National Inventory of Architectural Heritage register.

Table 13.10: Protected Structures located within the Study Area

CH ID	Type	RPS No	Short Description	Townland
CH020	RPS	169	St Senan's Church/St. Imy's Church	Carrowdotia North

13.4.4 Designated Architectural Heritage Sites

In 1997 Ireland ratified the Granada Convention on architectural heritage. This provided the basis for a national commitment to the protection of the architectural heritage throughout the country. The Local Government (Planning and Development) Act 2000, and the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999, made the legislative changes necessary to provide for a strengthening of the protection of architectural heritage.

13.4.4.1 Architectural Conservation Areas

The Clare County Development Plan 2023–2029 (Clare County Council, 2023) was consulted for records relating to Architectural Conservation Areas (ACAs). The stated objective of ACAs is to conserve and enhance the special character of the area, including traditional building stock and material finishes, spaces, streetscapes, landscape and setting.

There are no areas listed as ACAs incorporated by the study area.

13.4.4.2 National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (NIAH) (Department of Housing, Local Government and Heritage) is a state initiative under the administration of the Department of Housing, Local Government and Heritage (DHLGH). It was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 (Government of Ireland, 1999). Its purpose is to identify, record and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently, as an aid in the protection and conservation of the built heritage.

NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

There is one site from the NIAH register located within the study area. This is St. Senan's/St. Imy's church (CH020). This is also recorded as a Protected Structure.

Table 13.11: National Inventory of Architectural Heritage (NIAH) located within the Study Area

CH ID	Type	NIAH No;	Short Description	Townland
CH020	NIAH	20406719	St Senan's Church/St. Imy's Church	Carrowdotia North

13.4.4.3 Clare Coastal Architectural Heritage Survey

The Clare Coastal Architectural Heritage Survey was implemented under the *County Clare Heritage Plan,* 2003-2007, and was carried out between 2006 to 2007. It was an almost comprehensive survey of post-1700 structures that were considered to have vernacular, engineering, and architectural value (Halpin & O'Connor 2007/08, 2). It included coastal structures and a sample of stone roofed buildings (Halpin & O'Connor 2007/08, 10–23). Some sites surveyed were also listed on the RPS (*Ibid*, 7). There is one site within the vicinity of proposed development that is recorded in the Clare Coastal Survey. This is a boat slipway (CH021), located within the Shannon Estuary approximately 620m to the west of the application boundary.

Table 13.12: Clare Coastal Architectural Heritage Survey sites within the Study Area

CH ID	Type	CS No;	Short Description	Townland
CH021	Clare coastal survey	110	Boat Slipway	Carrowdotia North

13.4.5 Undesignated Archaeological and Architectural Sites

This section outlines the sites that are considered to be of cultural heritage value, but which do not fall within the above categories as they are not registered. Such sites may include lime kilns, dwellings/outhouses, trackways or townland boundaries etc. identifiable on the First Edition 6 inch and 25-inch Ordnance Survey maps and/or noted during the field visit.

13.4.5.1 Sites Identifiable on Cartographic Sources

The cartographic record for the study area was examined for the purposes of this report. The First Edition 6-inch Ordnance Survey Sheet (1829-41), First Edition 25-inch Survey (1897-1913) and the First Edition 6-inch Cassini Survey (c.1940) were consulted to identify undesignated cultural heritage (UCH) sites that may be impacted on by the proposed scheme.

There are six undesignated cultural heritage sites noted to have been recorded within the application site boundary, as listed in Table 13.13. In each instance, these were likely to have been removed due to the development of the Ash Storage Area, or in the case of CH031, due to land reclamation to accommodate the construction of Moneypoint Generating Station.

Table 13.13: Undesignated Archaeological and Architectural sites identifiable from cartographic sources located within the Study Area

CH ID	Type	Short Description	Townland
CH026	UCH	Limekiln	Carrowdotia North
CH027	UCH	Well	Carrowdotia North
CH028	UCH	Well	Carrowdotia North
CH029	UCH	Well	Carrowdotia North
CH030	UCH	Vernacular Settlement	Carrowdotia North
CH031	UCH	Salmon Weir	Carrowdotia North

13.4.5.2 Townland Boundaries

A townland is the smallest official land unit in the country. Ireland is made up of approximately 60,000 townlands. As a result, townland boundaries are ubiquitous in the Irish countryside and have been incorporated into the modern agricultural landscape. Many townlands predate the arrival of the Anglo Normans and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. This suggests that many the boundaries of many of these territorial units preserve landscape divisions from the medieval period and perhaps earlier. The townland names and boundaries were standardised in the 19th when the Ordnance Survey began to produce large-scale maps of the country. Research into the name of these land units frequently provides information relating to its archaeology, history, folklore, ownership, topography or land use.

The First Edition 6-inch Ordnance Survey was consulted in order to identify the location of townland boundaries that may be impacted on by the proposed development. The proposed development overlies or crosses two townland boundaries. However, in each instance, the townland boundary has already been broken by the exiting road network or removed in its entirety by earlier works.

Table 13.14: Townland Boundaries crossed by the Proposed Development

CH ID	Type	Short Description	Townland
CH022	Townland Boundary	Ballymacrinan/Carrowdotia North Townland Boundary	Ballymacrinan/Carrowdotia North
CH023	Townland Boundary	Carrowdotia North/Carrowdotia South Townland Boundary	Carrowdotia North/Carrowdotia South

13.4.5.3 Sites Identifiable on Aerial Photography and Satellite Imagery

Ortho-rectified aerial photography available from the Ordnance Survey of Ireland was inspected in order to identify possible features of cultural and heritage significance. Aerial photography from the 1995, 2000 and 2005 fly-overs was inspected, as well as the latest OSI images, LiDAR imagery (where available), Google Earth and Bing Maps satellite imagery.

No additional undesignated cultural heritage sites were identified from aerial photography and satellite imagery within the proposed development site.

13.4.5.4 Sites Identified during Field Inspection

The proposed development site and surrounding lands were inspected by Rubicon Heritage during September 2023. No additional sites or features of archaeological, architectural and cultural heritage significance were identified during the visit.

13.4.6 Areas of Archaeological Potential

Areas of archaeological potential (AAPs) are additional areas or locations whose landscape characteristics suggest a higher potential for unknown archaeological features to be present e.g. riverine, estuarian or peatland environments. There are two areas of archaeological potential. However, both have already been greatly impacted on by the previous development of Moneypoint through the 20th century. CH025 has been entirely developed with the stream (Molougha river) now culverted, while CH025 underlies the present and permitted Ash Storage Area.

Table 13.15: Areas of Archaeological Potential located within the Study Area

CH ID	Type	Short Description	Townland
CH024	Area of Archaeological Potential	Coastal Area of Archaeological Potential	Carrowdotia North
CH025	Area of Archaeological Potential	Riverine Area of Archaeological Potential	Carrowdotia South

13.4.7 Toponomy and Townlands

The Irish landscape is divided into approximately 60,000 townlands and the system of landholding is unique in Western Europe for its scale and antiquity. Many townlands predate the arrival of the Anglo Normans and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. The townland names and boundaries were standardised in the 19th when the Ordnance Survey began to produce large-scale maps of the country. The original Irish names were eventually anglicised to varying degrees, depending in part upon the linguistic skills of the surveyors and recorders. A study of the townland names can provide information on aspects of cultural heritage including descriptions of the use of the landscape by man and the potential presence of archaeological or cultural heritage sites or features.

There are six townlands within the study area. The placenames are largely reflective of the topographical setting or subdivision of each townland, with the exception of Ballymacrinan, which makes reference to the familial name Mhic Dhroighneáin, and Clooneylissaun which refers to the name Uí Ghliasáin.

Table 13.16: Townland Names within the Study Area (after Irish Placename Commission)

English Name	Irish Name	Glossary
Ballymacrinan	*Baile Mhic Dhroighneáin*	Townland (of Mhic Dhroighneáin)
Carrowdotia North	*An Cheathrú Dhóite Thuaidh*	Quarterland
Carrowdotia South	*An Cheathrú Dhóite Theas*	Quarterland
Clooneylissaun	*Cluain Uí Ghliasáin*	Meadow (of Uí Ghliasáin)
Moyne	*An Mhaighean*	Little plain
Poulnadarree	*Poll na Daraí*	Hole, pool, (tidal)stream?

13.4.8 Recent Excavations

The Excavations Bulletin is an annual account of all excavations carried out under license. The database is available online at www.excavations.ie and includes excavations from 1985 to 2022. This database was consulted as part of the desktop research for this report to establish if any archaeological investigations had been carried out within the study area. The database produced only two results for archaeological excavations undertaken within the study area. Neither excavation identified archaeological deposits.

Table 13.17: Recent Excavations within the Study Area

CH ID	Excavation No:	Short Description	Townland
CH032	09D061; 09R155	Nothing of archaeological significance	Carrowdotia South
CH033	02E0676	Nothing of archaeological significance	Carrowdotia North

13.4.9 Intangible Heritage/Irish Folklore Commission

Cultural Heritage is a broad term that includes Archaeological Heritage, Built Heritage, Portable Heritage, and other resources inherited from the past by contemporary society. It consists of the tangible and intangible traces of the interactions between people and places, people and nature and people and objects through time (TII 2022, 8). Folklore and local tradition are examples of intangible interactions between people and places where they live. In Ireland, work was done by the Irish Folklore Commission, and its successors, to collect and preserve Irish folklore. The Schools' Collection, for example, collected folklore and local traditions from pupils of 5,000 primary schools (National Folklore Collection 2023). The School's Collection (1937–38) contains an entry about the parish of Killimer, in which the study area is situated. The entry was written by the Burrane National School and contains detailed accounts on the people who used to live in the parish and the religious myths and folklores that they believed in. The survival of such sources mean we can gain an insight into the people lived here, the stories and beliefs that influenced how they viewed their landscape, and the monuments within it. No entry appears to pertain to the area of the proposed development site.

The role of quarrying in the local economy through the 19th century features in the folk record for Moneypoint. Research undertaken by the Killimer Local History Group outlined quarrying activity at the nearby Moneypoint Quarry in the townland of Carrowdotia North (Killimer Local History, 237):

Miss O'Grady was the then proprietor of Moneypoint Quarry [1896]. She resided in Moore Street, Kilrush. She was renting Moneypoint Quarry from the Vandeleur Estate and she paid 100 Pounds for the privilege. There was work for about 40 families who lived the surrounding townlands. Some of the workers lived in little stone-built huts near Moneypoint. The huts were known as Lane Houses.

13.5 Likely Significant Impacts

13.5.1 Do Nothing

The do nothing scenario seeks to describe the consequences that are reasonably likely to occur without the proposed development. If the proposed development were not to proceed, to maintain security of supply it will be necessary to continue the operation of Moneypoint fuelled by coal. No further direct or indirect impacts on archaeological, architectural and cultural heritage would occur.

13.5.2 Construction Phase

Direct Impacts: Most impacts during construction phase are likely to be direct impacts as a result of sub-surface disturbance or construction works. Direct impact refers to a 'physical impact' on a monument or site. The construction phase of the development consists largely of earthmoving activities. All impacts at this phase are considered to be negative and permanent.

Given that the proposed development site already comprises a heavily industrialised landscape, no direct impacts are predicted due to proposed construction works and partial dismantling of the coalyard.

13.5.3 Operation and Maintenance Phase

During the operational phase, direct impacts to the CH sites may occur due ground disturbance as a result of the removal of ash from the Ash Storage Area. The sites which may possibly be impacted are summarised in Table 13.8. However, overall, there will be limited change to the character of this already developed industrial environment.

Table 13.18: Description of Impacts to CH Sites at Operation Phase

CH No.	Proposed Development	Summary	Operation Phase Impacts	Magnitude of Impact prior to implementation of mitigation measures	Baseline Value	Significance of Impact prior to implementation of mitigation measures
CH022	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Ballymacrinan/Carrowdotia North townland Boundary	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative
CH024	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Coastal Area of Archaeological Potential	Limited Potential for Direct Impact to buried archaeological deposits from construction works	Profound	High	Significant negative
CH026	Removal of existing ash from a cell then use this cell for the future storage of FGD By-product.	Limekiln marked on 1st Edition Ordnance Survey sheet	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative
CH027	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Well	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative
CH028	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Well	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative
CH029	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Well	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative
CH030	Removal of existing ash from a cell, then use this cell for the future storage of FGD By-product.	Vernacular Settlement	Limited Potential for Direct Impact to buried Cultural Heritage from construction works	Profound	Medium/Low	Slight negative

13.5.4 Decommissioning Phase

Subject to the implementation of the appropriate archaeological mitigation measures during the operational phase of the development, no mitigation measures are required for archaeological, architectural and cultural heritage during the decommissioning phase of the proposed development. Given that the proposed development site already comprises a heavily industrialised landscape, no direct impacts are predicted during the decommissioning phase of the proposed development including any dismantling works. On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and IE licences, unless otherwise authorised.

13.6 Cumulative Effects

Cumulative impacts encompass the combined effects of multiple developments or activities on a range of receptors. In this case the receptors are the archaeological monuments and architectural/cultural heritage sites in the immediate vicinity of the proposed development. Cumulative impacts at the construction and operational stages are considered.

The proposed development site is located in an already developed and industrialised setting with no sites with statutory protections located within the application site. Whilst the construction phase of the proposed development will not impact directly on any sites included in the Record of Monuments and Places, and archaeological testing and monitoring of recent past developments in the vicinity of the current site have not uncovered sub-surface archaeological remains, it is possible that sub-surface archaeological features or finds may underly the Ash Storage Area. However, given the sub-surface nature of potential archaeology, the potential to excavate this site through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. Furthermore, the implementation of mitigation measures for the proposed development will ensure that the cumulative effect is neutral and not significant.

Subject to the implementation of the appropriate archaeological mitigation measures during the construction phase of the development, no residual cumulative impacts on archaeological, architectural and cultural heritage are predicted.

13.7 Mitigation and Monitoring Measures

13.7.1 Mitigation Measures

To mitigate the impact of the proposed development, the following mitigation strategy will be implemented during the construction phase of the development.

Any potential direct impacts to the cultural heritage landscape within the application site boundary is greatly limited by the fact that all of the application area comprises an existing industrialised landscape that has been developed through the second half of the 20th century. The south-eastern portions of the proposed development site comprise an existing coal-fired power station, and the footprint of the proposed development is entirely within the extent of the existing power station and associated industrialised lands. As the site is already developed, no requirement for archaeological monitoring is recommended at this location.

In the north-western portion of the proposed development site, in the area currently used for ash storage, there are a number of CH sites identified from early cartographic sources that are associated with the vernacular landscape (CH022; CH026-CH030), as well as a coastal Area of Archaeological Potential (CH024). CH022 and CH026-CH030 were identified from early cartographic sources. These sites have no statutory protections and now underly the present Ash Storage Area. The potential for their survival under a significant depth of ash is unclear, and

any potential impact to these CH sites is also limited by the potential for them having been already entirely removed prior to the establishment of the Ash Storage Area.

Given the impractical circumstances for safely undertaking any remote archaeological prospection or test-trenching at the locations of CH022, CH024 and CH026-CH030 the following mitigation measures are recommended:

- Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.

13.7.2 Monitoring Measures

Given the impractical circumstances for safely undertaking any remote archaeological prospection or test-trenching at the locations of CH022, CH024 and CH026-CH030 the monitoring measures outlined in Section 13.7.1 above are recommended.

13.8 Residual Impacts

The proposed development is located in an already developed and industrialised setting. Whilst the construction phase of the proposed development will not impact directly on any sites included in the RMP, limited potential for sub-surface archaeological deposits in the area presently occupied by the ash storage site remains. However, given the sub-surface nature of potential archaeology, the potential to excavate this site through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. Furthermore, the implementation of mitigation measures for the proposed development will ensure that the cumulative effect is slight and/or moderate, and not significant.

Subject to the implementation of the appropriate archaeological mitigation measures during the operational phase of the development, no significant residual impacts on archaeological, architectural and cultural heritage are predicted.

Table 13.19: Description of Residual Impacts to CH Sites at after mitigation

CH No	Phase	Impact Type	Mitigation Measures	Magnitude of Impact after Implementation of Mitigation Measures
CH022	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Imperceptible
CH024	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Slight Negative
CH026	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Imperceptible
CH027	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County	Imperceptible

CH No	Phase	Impact Type	Mitigation Measures	Magnitude of Impact after Implementation of Mitigation Measures
			Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	
CH028	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Imperceptible
CH029	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Imperceptible
CH030	Operational	Direct	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service	Imperceptible

14 The Landscape

14.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on landscape and visual receptors. The assessment is based on the development as described in Chapter 4 of this EIAR.

This Landscape and Visual Impact Assessment (LVIA) describes the landscape context of the proposed development, as described in Chapter 4, and assesses the likely landscape and visual impacts of the proposed development on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from; Visual Obstruction (blocking of a view, be it full, partial or intermittent) or Visual Intrusion (interruption of a view without blocking).

14.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the landscape and visual receptors are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

14.2.1 Polices

There are no relevant national policies relating to this assessment but the relevant policies from the Clare County Development Plan 2023-2029 are identified in Section 14.4.

14.2.2 Guidelines

- Environmental Protection Agency (EPA), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022.
- Landscape Institute and the Institute of Environmental Management and Assessment (eds.) (2013) Guidelines for Landscape and Visual Impact Assessment. Routledge, Oxon.

14.3 Methodology

14.3.1 Approach to Data Collection

The following information and data sources (Table 14.1) have been considered during the production of this EIAR.

Table 14.1: Data Sources used to inform the Landscape chapter of this EIAR

Data source	Date	Data contents
Clare County Development Plan 2023-2029	05/09/2023	As per Section 14.4
National Parks and Wildlife Service	05/09/2023	As per Section 14.4
The Heritage Council – HeritageMaps.ie	05/09/2023	As per Section 14.4
Ordnance Survey maps	05/09/2023	As per Section 14.4
Coillte Recreation	05/09/2023	As per Section 14.4
Discover Ireland – DiscoverIreland.ie	05/09/2023	As per Section 14.4
Sport Ireland Trails	05/09/2023	As per Section 14.4
Google Maps	05/09/2023	As per Section 14.4

14.3.2 Approach to Impact Assessment

Production of this Landscape and Visual Impact Assessment involved:

- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the County Development Plans as well as other sensitive visual receptors.
- Undertake a Zone of Theoretical Visibility (ZTV) analysis. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposed development.
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage.
- Assessment of the significance of the landscape impact of the proposed development as a function of landscape sensitivity weighed against the magnitude of the landscape impact.
- Assessment of the significance of the visual impact of the proposed development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints.
- Incorporation of mitigation measures to reduce potential impacts and identification of residual impacts once mitigation has become established.

This comprehensive approach, combining desktop studies, fieldwork, and impact assessments, along with adherence to established guidelines, contributes to a robust evaluation of the potential landscape and visual impacts of the proposed development. It reflects a systematic and thorough process to understand, evaluate and address the potential effects on the surrounding environment.

14.3.2.1 Approach to Viewpoint Selection

Viewshed Reference Points are the locations used to study the visual impacts of the proposed development in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed by Macro Works using up to six categories of receptor type as listed below:

- Key views (from features of national or international importance);
- Designated scenic routes and views;
- Local community views;

- Centres of population;
- Major routes; and
- Amenity and heritage features.

Viewshed Reference Points might be relevant to more than one category, and this makes them even more valid for inclusion in the assessment. The receptors intended to be represented by a particular Viewshed Reference Point are listed at the beginning of each viewpoint appraisal.

14.3.2.2 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts; and,
- Significance of landscape effects.

The sensitivity of the landscape to change is the degree to which a particular landscape receptor, Landscape Character Area or landscape feature can accommodate changes or new elements, without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria set out in Table 14.2: Landscape Value and SensitivityTable 14.2.

Table 14.2: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site / National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and / or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and / or a change that extends beyond the physical works that may have an effect on the landscape character of the area. Table 14.3 refers to the criteria used for magnitude of landscape impacts.

Table 14.3: Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out in Table 14.4.

Table 14.4: Impact Significance Matrix

	Sensitivity of Receptor				
Scale/ Magnitude	***Very High***	***High***	***Medium***	***Low***	***Negligible***
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. For the purpose of this LVIA and in accordance with GLVIA-2013, judgements of 'Substantial' and above are considered to be 'significant impacts' in EIA terms.

14.3.2.3 Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the proposed development will be assessed as a function of sensitivity versus magnitude. In this instance, the sensitivity of the visual receptor weighed against the magnitude of the visual effect.

14.3.2.4 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape.

14.3.2.5 Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors; the visual presence (relative visual dominance) of the proposal and its effect on visual amenity. The magnitude of visual impacts is classified in Table 14.5.

Table 14.5: Magnitude of Visual Impact

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and / or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and / or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and / or it would not detract from, and may even enhance, the visual amenity of the scene

14.3.2.6 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used in respect of landscape impacts (Table 14.4).

14.3.3 Quality and Timescale of Effects

In addition to assessing the significance of landscape effects and visual effects, the EPA Guidelines 2022 require that the quality of the effects is also determined. This could be negative/adverse, neutral or positive/beneficial.

Landscape and Visual effects are also categorised according to their duration:

- Temporary – Lasting for one year or less;
- Short Term – Lasting one to seven years;
- Medium Term – Lasting seven to fifteen years;
- Long Term – Lasting fifteen years to sixty years; and
- Permanent – Lasting over sixty years.

14.3.4 Study Area

According to Guidelines for Landscape and Visual Impact Assessment 2013 (GLVIA), the first step in the assessment process is to determine a bespoke study area which is appropriate to the combination of the development type and the receiving landscape and visual context. Considering the nature of the project and similar studies, it is anticipated that the proposed works relating to the development are likely to be difficult to discern beyond approximately 2km and are not likely to give rise to significant landscape or visual impacts beyond this distance. For these reasons a 2km radius study area was selected. This study area will focus the assessment within the area where impacts may actually occur.

14.3.5 Limitations of this EIAR

Due to the transitory nature of construction works, photomontages were not prepared for the construction Phase. Otherwise, there are not considered to be any particular limitations to this assessment.

14.4 Receiving Environment

The landscape is the visible environment in its entirety, comprised of both natural and built elements, including topography, water bodies, vegetation, wildlife habitats, open spaces, buildings and structures. Landscape and visual sensitivities considered include statutory and non-statutory landscape designations, natural features, landscape character areas, notable deciduous trees of woodland, amenities and historic landscapes.

At a macro level, the study area is located in a relatively low-lying landscape north of the Shannon Estuary southeast of the settlement of Kilrush.

Within the study area, the topography is undulating between sea level and approximately 50m Above Ordnance Datum, with the eastern portion at the settlement of Killimer being slightly more elevated at approximately 60m Above Ordnance Datum. Watercourses in the area generally drain in a southerly direction. The most notable watercourse in the study area is called the “Tonavoher”, which flows through the settlement of Killimer in the eastern portion of the study area. To the west of Moneypoint Generating Station, the “Ballynote East” and the “Mologha” watercourses flow into Ballymacrinan Bay.

The most notable land use is industrial, at the location of Moneypoint Generating Station and adjacent windfarm, in the centre of the study area. Outside of the energy generation land use, the study area has a mixed land cover, ranging from farmed open fields to built-up industrial and commercial forestry with residential clusters. A large proportion of the study area is occupied by agricultural fields. Field patterns are generally composed of small to medium-sized fields demarcated by mature hedgerows.

The local population in the study area is limited to one-off houses dispersed along the local roads throughout the study area. It is also of note that there are numerous planning applications in the vicinity of the proposed development, as detailed in Chapter 5 of this EIAR.

The N67 national secondary road is the most significant public transport route within the study area. A network of local roads serves the local population. The Shannon Estuary is a major shipping channel and is critical to Moneypoint Generating Station.

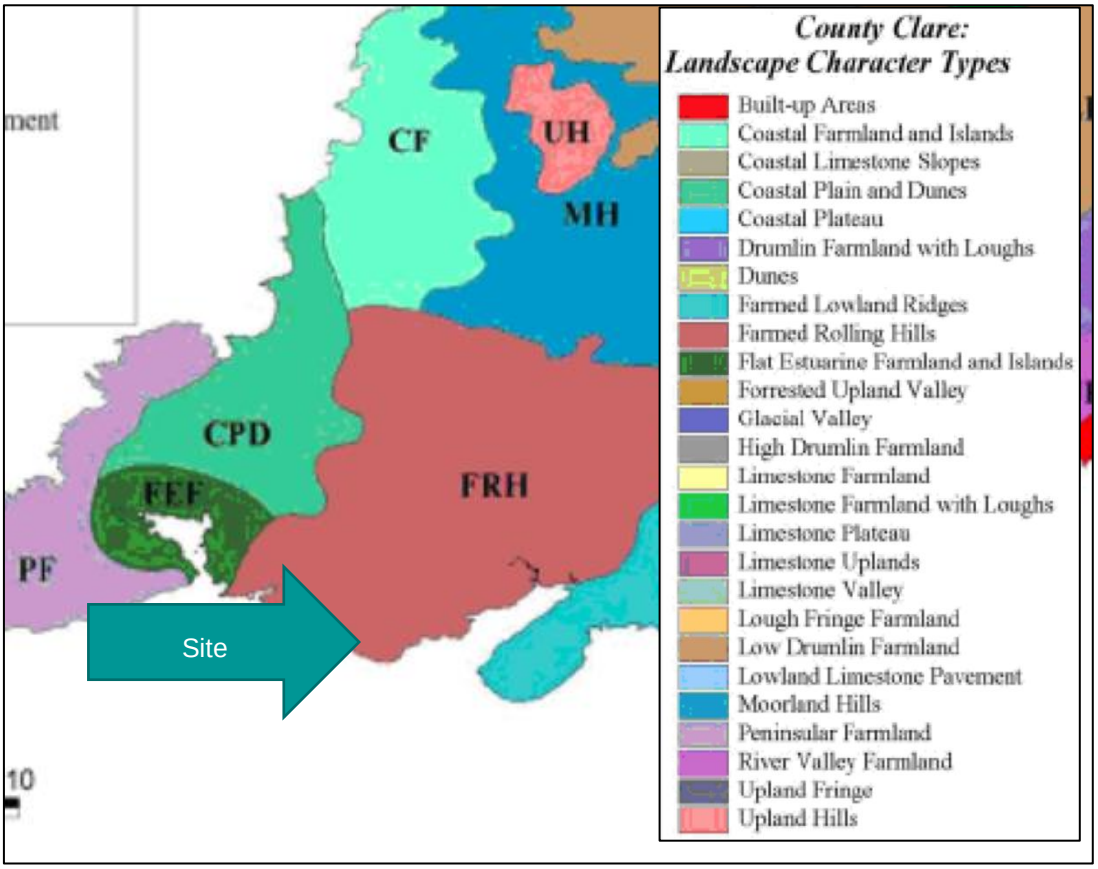
There are no notable landscape-related heritage amenities within the study area. The Wild Atlantic Way tourist driving route passes through the study area and the planning application boundary.

14.4.1 Clare County Development Plan 2023-2029

14.4.1.1 Clare Landscape Character Assessment

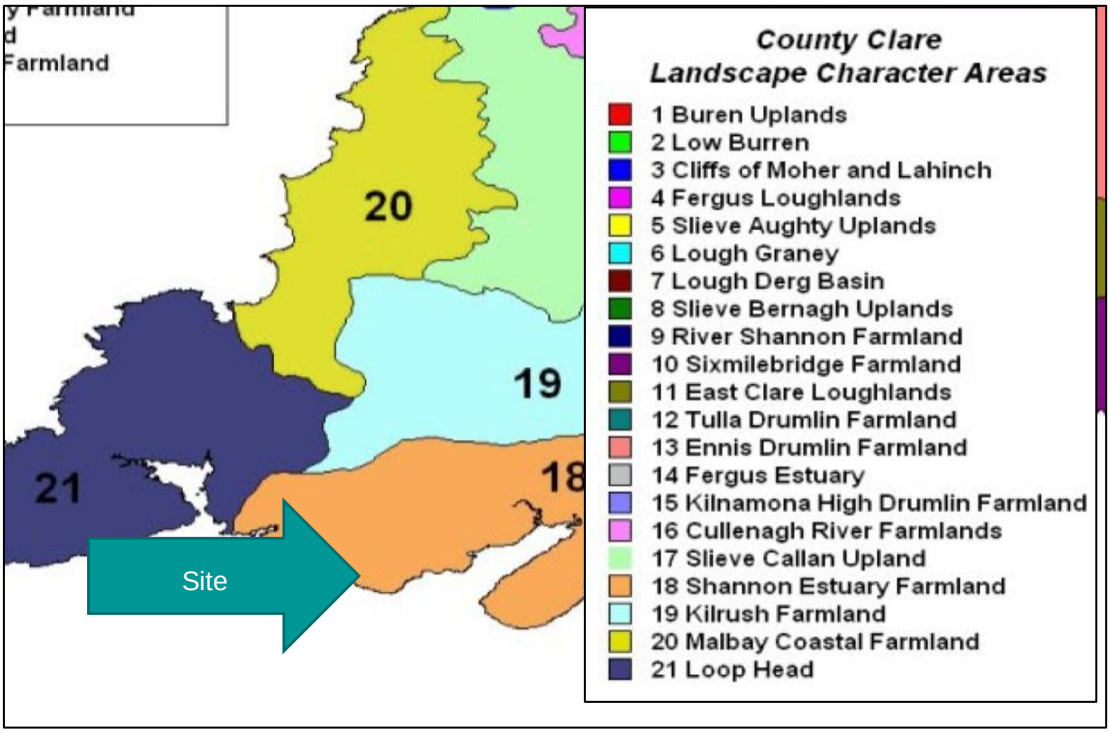
A Landscape Character Assessment has been prepared for County Clare and this is incorporated into the current Clare County Development Plan 2023 – 2029 (Clare County Council 2023). This identifies 26 separate Landscape Character Types (LCT). As Illustrated in Figure 14.1, the proposed development occurs in LCT24: 'Farmed Rolling Hills'.

Figure 14.1: Showing the location of the study area of the proposed development, overlaid on an excerpt from Figure 14.1 of the Clare County Development Plan which illustrates the Landscape Character Types within County Clare



The LCTs are then amalgamated into 21no. Landscape Character Areas (LCA) and the proposed development occurs within LCA18: 'Shannon Estuary Farmland' (Figure 14.2).

Figure 14.2: Showing the location of the study area of the proposed development overlaid on an excerpt from Figure 14.2 of the Clare County Development Plan which illustrates the Landscape Character Areas within County Clare.



In the Landscape Character Assessment, LCT24: 'Farmed Rolling Hills' is described as:

> *'Very varied, complex landscape incorporating many elements with a rolling landform that is very uneven. Land cover reflects this complexity with a mosaic of lowland blanket bog, improved and semi-improved pasture and blocks of commercial forest (coniferous). Varied enclosures including post and wire and hedgerows. Farms, houses and villages are quite frequent though dispersed throughout the area and there are distinct 'corridors' along major transport routes, where settlement is concentrated. Condition is also variable, with some areas more intact than others. The presence of bog and forestry also creates the impression of being in a more upland area in places. Views are afforded from more elevated hills across the surrounding areas and to the Shannon estuary.'*

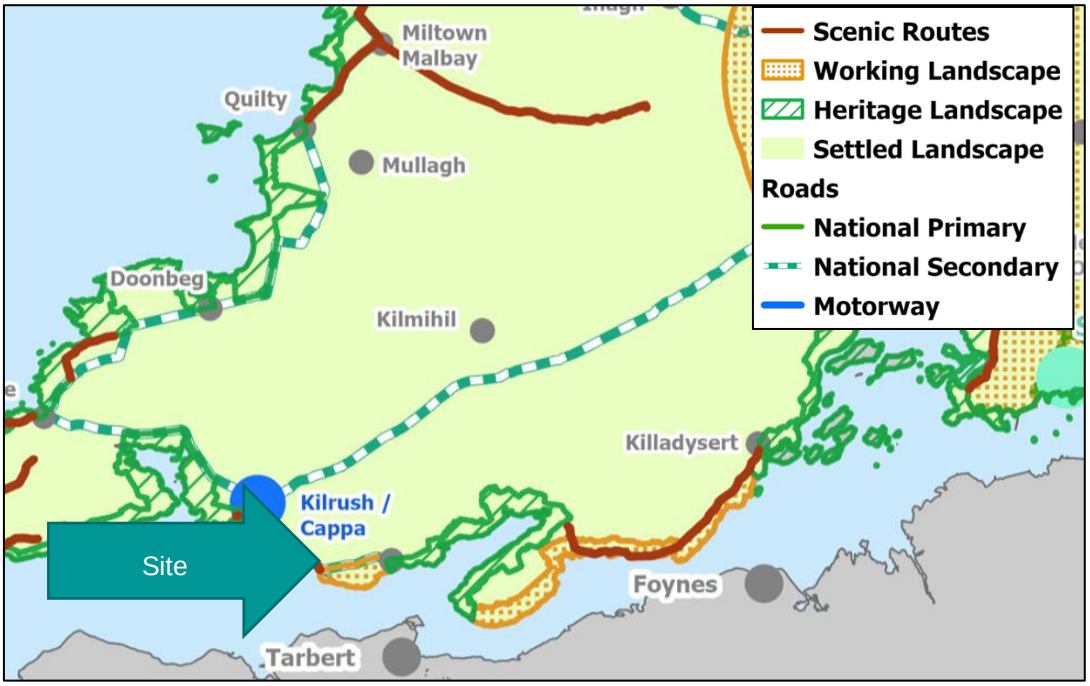
LCA 18: 'Shannon Estuary Farmland', according to the Landscape Character Assessment, the key characteristics of this LCA are as follows:

- *'Prominently ridged landscape, with linear hills aligned south-west to north-east.*
- *Secluded areas interspersed with more open views. Views are afforded across the Shannon estuary and across to Limerick from elevated areas and on the estuary shores.*
- *Coastal fringe is flatter and slopes down towards the sea.*
- *Diverse habitat and land cover.*
- *Scattery Island is an important historical and focal feature.*
- *Complex patterns of pasture, woodland and scrub habitats.*
- *Old Vandeleur Estate plantations, gardens and restored woodland recreation area.'*

14.4.1.2 Other Clare Landscape Designations

Using the LCAs from the Landscape Character Assessment as a basis, Clare County Council has identified three types of landscapes for the purposes of developing and implementing landscape policy. These include 'Settled Landscapes', 'Working Landscapes' and 'Heritage Landscapes'. Map 14a of the Clare County Development Plan 2023 – 2029 (Clare County Council 2023) and Map C in Volume 2 of same, identifies where these various landscapes occur. Figure 14.3 indicates that the study area straddles the Working Landscape to the south of the N67 national road and the Settled landscape to the north. The Working Landscapes are divided in to the 'Western Corridor Working Landscape' and the 'Shannon Estuary Working Landscape' with the latter being the one relevant to the proposed development.

Figure 14.3: Showing the location of the study area of the proposed development overlaid on an excerpt from Map 14A of the Clare County Development Plan which illustrates the landscape and scenic designations within County Clare



The (construction/operation/decommissioning) 'CPD14.3' of the Clare County Development Plan 2023-2029 (Clare County Council 2023) relates specifically to the Shannon Estuary Working Landscape:

> *"It is an objective of Clare County Council:*
>
> *a) To permit development in these areas that will sustain economic activity of regional and national significance especially through the protection of resources to sustain large-scale energy projects, logistics, large-scale manufacturing and associated infrastructure. All such developments shall be required to conform to relevant management and conservation objectives for designated and protected habitats and species within the estuary;*
>
> *b) To ensure that selection of appropriate sites in the first instance within this landscape, together with consideration of the details of siting and design, are directed towards reducing visual impact and that residual visual impacts are minimised;*
>
> *c) To ensure that particular regard be had to avoiding intrusions on scenic routes and on ridges or shorelines;*

d) To ensure that developments in these areas be required to demonstrate:

i. That sites have been selected to avoid visually prominence wherever feasible;

ii. That site layouts avail of existing topography and vegetation to reduce visibility from scenic routes, walking trails, public amenities and roads;

iii. That design for buildings and structures reduces visual impact through careful choice of form, finish and colours and that any site works seek to reduce visual impact of the development."

14.4.1.3 Seascape Character Assessment

A Seascape Character Assessment of County Clare was carried out as part of the aforementioned Landscape Character Assessment. The Seascape Character Assessment identified 12no. individual Character Areas in County Clare. The southern edge of the study area adjoins the coast along the Seascape Character Area 10 – Lower Shannon.

Development Plan Objective 'CDP14.6' of the Clare County Development Plan 2023-2029 (Clare County Council 2023) relates to Seascape Character Areas:

"It is an objective of Clare County Council:

a) To require that it be demonstrated that every effort has been made to visually integrate any proposed development within a Seascape Character area. This must be demonstrated by assessing the proposal in relation to:

- *Views from land to sea;*
- *Views from sea to land;*
- *Views along the coastline.*

b) To ensure that appropriate standards of location, siting, design, finishing and landscaping are achieved."

14.4.2 Views of Recognised Scenic Value

Views of recognised scenic value are primarily indicated within county development plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, websites, guidebooks, roadside rest stops or on post cards that represent the area. There are no recorded designated views within the study area. The portion of the N67 national secondary road that passes within the study area is part of the Wild Atlantic Way tourist driving route. The sections to the west of the planning application boundary are also designated as a 'Scenic Route' in the Clare CDP (Figure 14.3).

14.4.3 Zone of Theoretical Visibility Analysis

The ZTV analysis is a computer analysis process. Three were undertaken using the highest points of the three key project elements (2 No. HFO tanks, 2 No. auxiliary boilers [which includes one proposed stack] and the Ash Storage Area), in conjunction with a digital surface model of the analysis area to determine from where in the surrounding landscape are there potential views of these proposed elements. The result of this visibility analysis is a ZTV mapping, as shown in Figure 14.4, Figure 14.5 and Figure 14.6. These ZTV maps have been produced using Digital Surface Model data. This form of spatial data takes account of existing vegetation and buildings in terms of the screening they offer and offers a realistic measure of visual exposure within the surrounding landscape.

It is important to note that the ZTV maps are conservative in its analysis of potential for visibility of the proposed development, as the ZTV patterns (yellow areas) includes the tops of trees and buildings within the Digital Surface Model that are not necessarily accessible.

These ZTV maps indicate that the potential for visibility of the proposed development is very restricted, particularly for the HFO tanks and the auxiliary boilers. The potential for visibility is predominantly limited to views of the Ash Storage Area from the agricultural fields to the west, north, northeast and east of the Ash Storage Area.

The ZTV maps were part of the initial desktop study and were utilised to establish a high-level understanding of the extent of the visibility of the various elements within the proposed development. It provides an indication of the areas with the highest potential for suitability as potential viewpoints. After the viewpoints have been selected in the field, the visual impact assessment transitions to a focused analysis of the specific visual impact on these viewpoints with reference to the accompanying verified photomontages and the ZTV becomes less relevant.

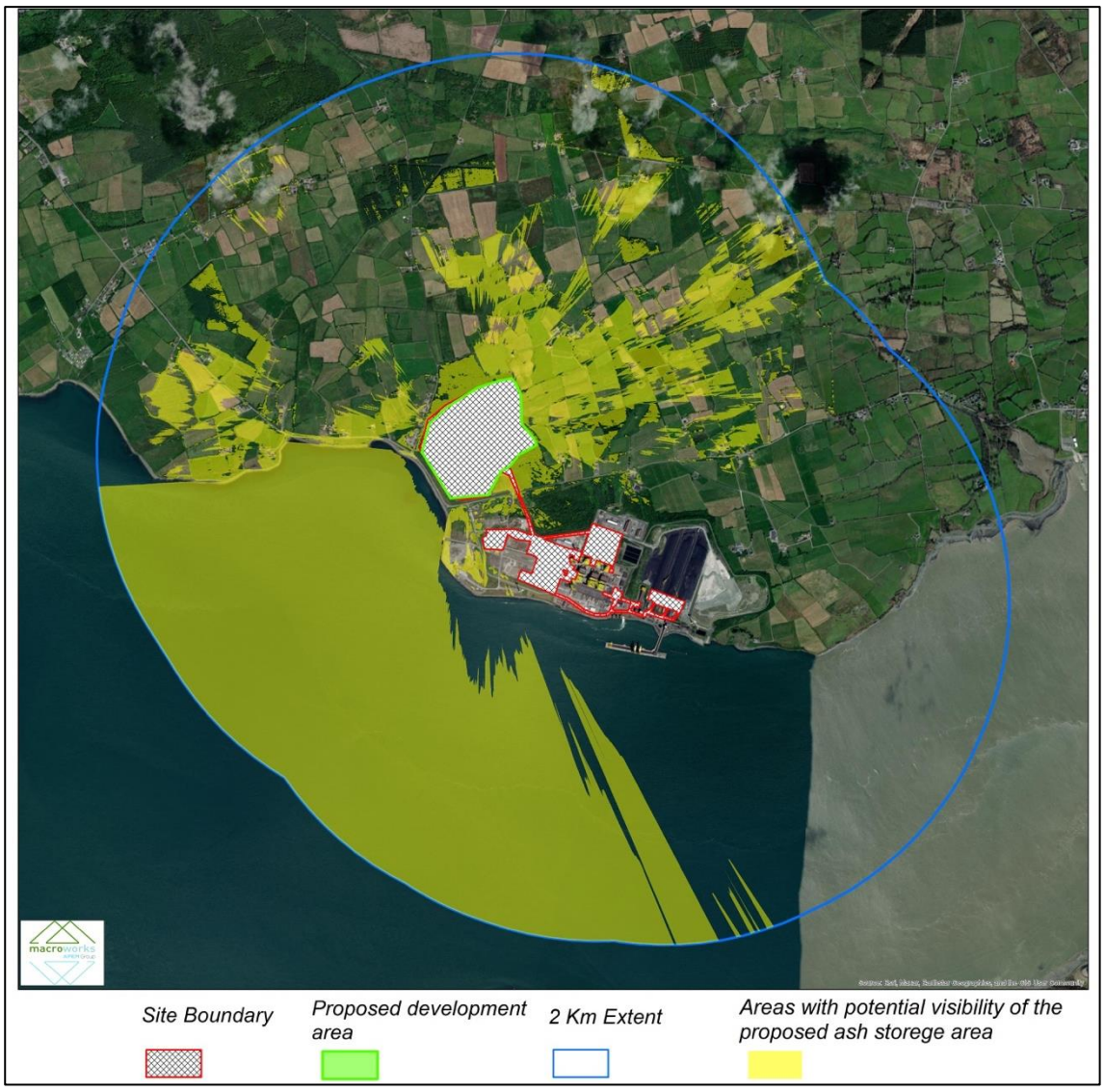
Figure 14.4: ZTV map for the proposed HFO tanks based on a Digital Surface Model that accounts for screening by surface elements such as existing buildings, hedgerows and trees lines.

Source: Macroworks 2023

Figure 14.5: ZTV map for the proposed auxiliary boilers based on a Digital Surface Model that accounts for screening by surface elements such as existing buildings, hedgerows and trees lines

Source: Macroworks, 2023

Figure 14.6: ZTV map for the proposed changes to the Ash Storage Area based on a Digital Surface Model that accounts for screening by surface elements such as existing buildings, hedgerows and trees lines.



Source: Marcoworks 2023

14.4.4 Representative Viewpoints selected for Visual Impact Assessment

The Viewshed Reference Points selected in this instance are set out in the Table 14.6 and indicated on Figure 14.7 below.

Table 14.6: Outline Description of Selected Viewshed Reference Points

VRP No.	Location	Direction of View
VP1	Local road, Ballymacrinan	S
VP2	N67 national road, Moyne	SE
VP3	N67 national road, Ballymacrinan	E
VP4 (a&b)	N67 national road, Carrowdotia North	N&S
VP5	N67 national road, Carrowdotia South	SW
VP6	Local road, Carrowdotia South	W
VP7	Local road, Poulnadarree	W

Figure 14.7: Map showing viewshed reference points and visualisation from the Shannon Estuary (SV1)

Source: Macroworks, 2023

14.4.4.1 Shannon Estuary

The River Shannon is Ireland's longest river and it flows through the southern portion of the study area, into the wild waters of the Atlantic Ocean to the west. It provides a rich resource for water-based recreation. It is not possible to create a verified photomontage from a waterbody. However, a visualisation was created to represent the approximate relative position and scale of the proposed development in relation to an existing feature, based on existing imagery captured from the River Shannon (Appendix K - SV1). However, this is not a viewshed reference point and is included in this assessment to illustrate the nature of the views likely to be possible from the Shannon Estuary.

14.4.5 Landscape Sensitivity

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the GLVIA 2013, which are set out below and discussed relative to the application site and study area.

The area around the application site is dominated by the presence of the Moneypoint Generating Station and Ash Storage Area, which has a distinctly industrial extractive character and is of a substantial scale. There is a range of agricultural land management practices within the wider study area, some relatively intensive, with few untidy, fallow or unused areas. Generally, field boundaries appear well maintained, but there are instances where post and wire fences have replaced hedgerows. Over time, the field patterns have changed dramatically within the study area due to hedgerow removal associated with agricultural intensification.

A pleasant countryside aesthetic prevails in some portions of the study area. However, it is generally a rural environment with associated productive rather than scenic values. There is a designated scenic route in the western portion of the study area where views are afforded of the Shannon estuary, but the eastern terminus is adjacent to, and is dominated by, the overt Moneypoint Generating Station and Ash Storage Area.

The study area is not a distinctive or rare landscape, particularly in the context of County Clare, a county that contains numerous landscape heritage features that are recognised at an international level. There are no particularly unique or remarkable landscape elements within the study area.

The landscape of the study area is not particularly synonymous with outdoor recreation other than the portion of the N67 national secondary road that forms part of the designated scenic route and is the route of the Wild Atlantic Way.

A minor degree of rural tranquillity occurs in the wider study area, away from the main roads, where the hedgerow structures create some sense of enclosure, and there are some naturalistic qualities relating to the Shannon Estuary.

A low ridge occurs a short distance north of the Moneypoint Generating Station, lined by the N67 national secondary road. This ridge divides the study area regarding viewshed (visibility), creating a southern visual catchment on the south-facing slopes above the Shannon Estuary and a northern visual catchment on the north-facing slopes on the opposite side of the N67. The landscape between the N67 and the Moneypoint Generating Station is heavily wooded.

There would not appear to be any strong landscape associations to particular people, historical events or mythology within the central study area. That is not to say that none exist, as all places have local landscape associations with certain families or historical incidents, such as the churches, cemeteries, castles, earthworks, ringforts, crannogs, holy wells and moated sites; however, these would not necessarily be associated with landscape values for the wider population.

14.4.5.1 Landscape Sensitivity Summary

The built-up nature of the application site and adjoining areas identify more readily as industrial rather than as a typical rural typology, and a key consideration is that the central study area is already strongly influenced by the existing Moneypoint Generating Station and adjacent Ash Storage Area.

Based on the factors outlined above, it is considered that this is a complex and productive landscape with typical rural land uses contrasted with heavy industry in a hinterland setting. The study area is by no means a rare or distinctive landscape and instead is a typical rural setting with robust and productive landscape values rather than susceptible scenic or naturalistic values. On balance, the landscape sensitivity to the proposed development is deemed to be low.

14.4.6 Visual Sensitivity

Views of the agricultural landscape are generally pleasant in terms of its ‘green’, settled working character. The network of hedgerows and vegetation that occur throughout it contribute to a sense of naturalness, and in combination with its undulating topography generates a high degree of containment in many locations.

However, whilst the agricultural context forms the primary landscape and visual experience, in the local landscape of the site, this is interrupted by the Moneypoint Generating Station and nearby windfarm. Also, by large scale road and electrical infrastructure which traverse through

the landscape. Indeed, all parts of this landscape, including those areas in agricultural use, demonstrate longstanding human intervention in the landscape.

Views towards the site are in no instance considered to be unique or form a core part of any key views. Likewise, the integrity and quality of landscape features is not considered to contribute to or generate any specific scenic value.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and the distance at which views are obtained. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape. Likewise, receptors located at closer proximity to the site are considered more susceptible to changes in views over those where views are experienced at distance.

In the context of this site, visual receptors are considered to be of no greater than medium-low sensitivity.

14.5 Likely Significant Impacts

14.5.1 Do Nothing

The Do Nothing Scenario is the scenario in which the proposed development does not go ahead and no development occurs. Under this scenario, there would be no landscape and visual impacts as there would be no construction or operational phases, and, as a result, there would be no change to the current landscape.

14.5.2 Construction Phase – Landscape

14.5.2.1 Magnitude of Construction Phase Landscape Effects

The proposed changes to the Ash Storage Area will not come into effect until the operational phase. The proposed development will involve additional infrastructure, equipment and structures during the construction of the HFO tanks and Auxiliary Boilers and the dismantling of the rising conveyor and stacker reclaimers. There will be an increase in construction-related activity within the Moneypoint Generating Station and an increase in vehicular movements within the surrounding road network.

The footprints of the HFO tanks and Auxiliary Boilers will occur within the existing Moneypoint Generating Station and a minimal amount of vegetation removal around the HFO bunds is required however this is considered to be imperceptible outside of the boundary. The HFO tanks and Auxiliary Boilers have a new permanent physical impact on the landscape but will occur in a long-established industrial facility where they will not detract from the existing character. It is not considered that the proposed development will noticeably detract from the integrity of landscape patterns or the productive landscape character that prevails in the agricultural portions of the study area, nor will it detract from the industrial character associated with the Moneypoint Generating Station.

For these reasons, the magnitude of impact on the landscape is deemed to be negligible.

14.5.2.2 Significance of Construction Phase Landscape Effects

The landscape impacts are classified as **Negative**. With reference to the significance matrix (Table 14.4), the medium-low landscape sensitivity judgement attributed to the study area coupled with a negligible magnitude of landscape impact is considered to result in an overall significance of **Imperceptible**. The duration of the landscape impacts is classified as **Short-term** (effects defined as lasting one to seven years in accordance with EPA Guidelines 2022).

14.5.3 Construction Phase – Visual

It is not considered beneficial to assess construction phase visual impacts from specific receptor locations using photomontages, which is instead reserved for the operational phase of the proposed development. This approach is partly on the basis that construction phase visual effects are constantly changing in nature, intensity and location. Furthermore, many potential construction-related visual effects (such as dust, lighting and heavy vehicle movements, etc.) are also not easily depicted or readily experienced through the use of static photomontages.

14.5.4 Operation and Maintenance Phase – Landscape

It is proposed to increase the thickness of the FGD/Ash capping layer from 0.6m up to a maximum of 1.6m in order to store all the FGD by-product produced during the years 2025 to 2029. This coupled with a reduced quantity of ash to be landfilled overall will result in a reduced height of up to 1.85m when compared to what was granted under permission P14/373 while maintaining the same profile. The footprint will not change. The physical effect on the landscape will be minimal and the impact on character will be immaterial.

The proposed HFO tanks and auxiliary boilers will be within the existing Moneypoint Generating Station. The complex cluster of structures will readily absorb the proposed additional relatively small-scale elements.

From a macro perspective of the overall landscape impacts, the broader landscape is also already characterised by the existing energy production infrastructure; thus, operational phase impacts will not markedly alter the existing landscape character.

Based on the factors discussed above, it is considered that the operational phase magnitude of landscape impact is negligible.

Operational phase landscape impacts will be **Neutral** in terms of quality. The significance of landscape impacts is a function of landscape sensitivity weighed against the magnitude of the landscape impact. This is derived from the significance matrix (Table 14.4) used in combination with professional judgement. It was established in Section 14.4.5 that the Landscape Sensitivity is low. It was determined in Section 14.5.3 that the magnitude of operational phase landscape impacts is negligible. As a result of this combination the overall significance of operational phase landscape impact is **Imperceptible**. Operational phase landscape impacts will, primarily due to the Ash Storage Area, be **Permanent** in duration.

14.5.5 Operation and Maintenance Phase – Visual

The assessment of visual impacts at each of the selected viewshed reference points is aided by photomontages of the proposed development. Photomontages are a ‘photo-real’ depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewshed reference point, the following images have been produced;

- Existing view
- Outline view (yellow outline showing the extent of the above ground elements of the proposed development overlaid on the photography)
- Montage view

Also included for contextual purposes is a visualisation from the Shannon Estuary (SV1).

Table 14.7: Summary of VP Locations and Effects

VP No.	Title and description of existing view	Receptor Sensitivity	Description and Magnitude of Visual impact	Residual Significance / Quality / Duration of Visual Impact
VP1	**Local road, Ballymacrinan** This is an open and locally elevated view. The foreground is an agricultural field that slopes gently away from the viewpoint. Immediately beyond a hedgerow is the Ash Storage Area associated with the Moneypoint Generating Station, which itself is visible in the middle ground. A windfarm is visible in the background.	**Medium-Low**	The permitted finished level of the Ash Storage Area (planning ref: 14373) would be visible rising above the hedgerow. The proposed finished level of the Ash Storage Area will marginally decrease the final finished level when compared to the permitted finish level, but it will be difficult to discern the difference. Therefore, the magnitude of visual impact is Negligible.	**Negative** **Imperceptible** **Permanent**
VP2	**N67 national road, Moyne** This is an open, complex and elevated view from a designated scenic route. The landform slopes away to the southeast from this viewpoint to reveal a rolling terrain with Moneypoint Generating Station and a windfarm in the middle ground set against a backcloth of the Shannon Estuary.	**Medium - Low**	The proposed finished level of the Ash Storage area would be visible just below the permitted finished level (Planning ref: 14373) of the Ash Storage Area but it will be difficult to discern the difference. The proposed Auxiliary Boilers will be visible immediately in front of the Moneypoint Generating Station. It will be substantially smaller in scale the relative to the existing structures within the Moneypoint Generating Station and will be viewed against a backcloth of the same, thus helping the proposed to be visually absorbed. The HFO tanks will be screened by a combination of intervening landform and vegetation. The change is unlikely to be noticed by a casual observer due to the high degree of existing similar developments The visual change will not detract from the visual amenity of the scene. For these reasons, the magnitude of impact is deemed to be Negligible.	**Neutral** **Imperceptible** **Permanent**
VP3	**N67 national road, Ballymacrinan** This is a low-lying view from the banks of the Shannon Estuary. In the foreground is the landform slopes to the shoreline which forms the route of the N67 road. Scrub in the middle ground partially screens the Ash Storage Area. Moneypoint Generating Station and a windfarm rise above the landscape and are viewed in silhouette against the sky.	**Medium - Low**	The northern portion of the proposed Ash Storage Area will be screened from view by the intervening vegetation. At the southern end, the increased final level as a result of the proposed Ash Storage Area may be identifiable to a keen observer but will be extremely similar in nature to the existing/permitted Ash Storage Area; thus, the visual change is unlikely to be noticed by a casual observer and will not detract from the visual amenity of the scene. The HFO tanks and Auxiliary Boilers will be fully screened from view. For these reasons, the magnitude of impact is deemed to be Negligible.	**Negative** **Imperceptible** **Permanent**
VP4	**N67 national road, Carrowdotia North** This is an enclosed view. Channelled views along the road corridor are afforded however, views to either side of the road are foreshortened. To the north is the Ash Storage Area enclosed by a fence and gate, while to the southeast,	**Low**	A heavily channelled and somewhat obstructed view of the Ash Storage Area will be possible to the north of this location. The increased final level as a result of the proposed Ash Storage Area may be identifiable to a keen observer but will be extremely similar in nature to the permitted Ash Storage Area (Planning ref: 14373); thus, the visual change is unlikely to	**Negative** **Imperceptible** **Permanent**

VP No.	Title and description of existing view	Receptor Sensitivity	Description and Magnitude of Visual impact	Residual Significance / Quality / Duration of Visual Impact
	the two tallest towers in the Moneypoint Generating Station are visible above intervening vegetation.		be noticed by a casual observer and will not detract from the visual amenity of the scene. The HFO tanks and Auxiliary Boilers will be located to the southeast and will be fully screened from view by a combination of intervening landform and vegetation. Therefore, the magnitude of visual impact is Negligible.	
VP5	**N67 national road, Carrowdotia South** This is an elevated and complex view from the settlement of Killimer. The foreground comprises of a school and associated carpark which is adjoined by a residential dwelling. Views to the west are partially screened by intervening vegetation in the middle ground but the Moneypoint Generating Station, wind turbines, steel towers and the Shannon Estuary are identifiable in the background.	**Medium - Low**	The proposed development will not be visible from this location due to a high degree of intervening screening. Therefore, by default, the magnitude of visual impact is Negligible.	**Neutral Imperceptible Permanent**
VP6	**Local road, Carrowdotia South** This is a broad and slightly elevated view from a locally elevated section of local road. A low trimmed roadside hedgerow runs along the boundary between the road and a large agricultural field in the foreground, which slopes gently away from the viewpoint towards the Shannon Estuary to the south. Vegetation in the middle ground screens the lower portions of the Moneypoint Generating Station, which is a predominant feature in the background, where the land use appears to be industrial in nature with high voltage overhead line towers, large buildings and wind turbines protruding on the skyline.	**Medium - Low**	The proposed development will not be visible from this location due to a high degree of intervening screening. Therefore, by default, the magnitude of visual impact is Negligible.	**Neutral Imperceptible Permanent**
VP7	**Local road, Poulnadarree** This is a somewhat secluded view from a narrow local road. Vegetated banks flank the road on both sides. Beyond the agricultural field in the foreground are farm buildings set against a backdrop of vegetation, above which rises the Moneypoint Generating Station.	**Medium - Low**	The proposed development will not be visible from this location due to a high degree of intervening screening. Therefore, by default, the magnitude of visual impact is Negligible.	**Neutral Imperceptible Permanent**

As seen in the visualisation for SV1 (Appendix K), the view afforded is a broad and uninterrupted view of the Moneypoint Generating Station. Erosion protection rocks separate the aquatic from the terrestrial in the foreground. In the middle ground is Moneypoint Generating Station, wind turbines and high voltage overhead line towers, which are the most notable features in the view. A low ridge provides a backcloth in the background.

The proposed auxiliary boilers will be visible immediately in front of the Moneypoint Generating Station. It will be substantially smaller in scale the relative to the existing structures within the Moneypoint Generating Station. It will be viewed against a backcloth of the same, thus helping the proposed to be visually absorbed. The HFO tanks will be screened by the Moneypoint Generating Station. The visual change is unlikely to be noticed by a casual observer due to the high degree of existing similar developments, nor will it detract from the visual amenity of the scene. Therefore, the visual impact of the proposed development from the Shannon Estuary is not deemed to be significant during the construction, operational or decommissioning phases.

For this reason, the proposed development is considered to comply with Development Pan Objective CDP14.6 of the Clare County Development Plan 2023-2029, which specifically references ‘views from the sea to the land’. The other aspects of the Objective CDP14.6 are incorporated in the other aspects of the overall impact assessment.

14.5.6 Decommissioning Phase

On cessation of activities the plant will be decommissioned, and the site remediated and restored in line with any requirements of the planning permission and IE licences, unless otherwise authorised. However, it is envisioned that on decommissioning some of the structures on site may be used for future developments such as those which may be linked to the ‘Green Atlantic @ Moneypoint’ project, which is in the early design and feasibility study stages. The assessment of the Ash Storage Area will remain the same during the decommissioning phase as the operational phase. The impact during the decommissioning phase is deemed to be **Positive** for all other elements. The significance of landscape impacts is a function of landscape sensitivity weighed against the magnitude of the landscape impact. This is derived from the significance matrix (Table 14.4) used in combination with professional judgment. It was established in Section 14.4.5 that the Landscape Sensitivity is low. It was deemed that the magnitude of the decommissioning phase landscape impacts is negligible. As a result of this combination, the overall significance of the decommissioning phase landscape impact is **Imperceptible**. Decommissioning phase landscape impacts will, primarily due to the Ash Storage Area, be **Permanent** in duration.

14.6 Cumulative Effects

The significance of effect on the landscape is no greater than **Imperceptible** during the construction phase or during the operation phase. The significance of all visual effects is no greater than **Imperceptible**. These results are at the very bottom end in the spectrum of significance of effects. Following a review of the permitted and proposed developments relevant to the proposed development, and with consideration of levels of impact of the proposed development in its own right, it is deemed highly unlikely for there to be any potential for significant cumulative impacts to occur as a result of the proposed development in conjunction with any other permitted or proposed developments.

The main potential for cumulative effects in this instance is in relation to the existing Moneypoint Generating Station and adjacent Ash Storage Area. There may be some small degree of cumulative visual effects during the construction phase due to construction activity within the site and vehicle movements on nearby roads, but these are not deemed to be significant. The operational phase in-combination effects of the existing Moneypoint Generating Station and adjacent Ash Storage Area, with respect to the proposed development, has been the focus of

the assessment already undertaken in respect of both landscape impacts and visual impacts. Therefore, a separate consideration of cumulative effects in isolation is not considered necessary in this instance, given the landscape and visual impact of the proposed development is considered to be not significant.

14.7 Mitigation and Monitoring Measures

14.7.1 Mitigation Measures

There are no specific landscape or visual mitigation measures proposed during the construction or operational phases.

14.7.2 Monitoring Measures

No monitoring is required as no mitigation measures are proposed.

14.8 Residual Impacts

As there are no mitigation measures proposed in relation to landscape and visual impacts, residual impacts are as described in the assessment.

15 Traffic and Transport

15.1 Introduction

This chapter presents an assessment of the likely Traffic and Transport effects on public roads impacted by the proposed development. The assessment is based on the proposed development proposals as described in Chapter 4.

This chapter sets out the existing conditions of the receiving environment and details the traffic that is likely to be generated during the construction phase of the proposed development assessing the effect upon the local, regional and national road network and identifies measures to reduce network disruption.

This chapter assesses the construction phase of the proposed development having regard to the *TII Traffic and Transport Guidelines* (May 2014), in respect that it fully details the levels of traffic generated and the routes likely to be subject to traffic impacts and is coherently supported by a construction Traffic Management Plan (TMP) (EIAR Appendix C.2).

Consistent with advice set out in the TII Traffic and Transport Guidelines (May 2014), a full Traffic and Transport Assessment (TTA) is not warranted in respect of the operational phase given that operational traffic associated with the proposed development will be similar to that of the existing development. Therefore, potential Traffic and Transport related environmental effects during the operational phase have been scoped out.

Cumulative effects associated with committed projects which are likely to generate traffic utilising the same public roads within the proposed development study area at the same time as traffic generated by the proposed development have also been assessed.

Air Quality and Noise and Vibration assessment matters pertaining to Traffic and Transport are addressed in Chapter 7 and Chapter 9 respectively.

15.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents relevant to the assessment of Traffic and Transport effects of the proposed development are set out in this section.

15.2.1 Polices

Table 15.1 provides a summary of the policies relevant to traffic and transport.

Table 15.1: Relevant Traffic & Transport Policies

Document Title	Source and Year	Policy Detail	Relevance to Assessment
Clare County Development Plan 2023-2029	Clare County Council website, 2023	The Clare County Development Plan 2023-29 (CCDP 23-29) sets out the strategy for planning and sustainable development for Clare County Council (Clare Co Co) for the next six years. This includes climate action, urban/rural settlement strategies, economic development, Moneypoint Generating Station and sustainable communities. The following policies are of direct relevance: ● CDP 2.14 Transition to a Low Carbon Economy & Society: Overarching policy in the technologies to allow Country Clare to transition to low energy usage, which includes point g: ● 'To support sustainable modes of transport such as walking and cycling through promotional strategies and the provision of active travel infrastructure where required'. ● CDP 2.15 Renewable Transport: relevant policies are: ● To seek initiatives that will achieve the decarbonisation of the transport sector, moving to the use of clean generated electricity bio-gas hydrogen and other non-fossil fuels for private and public transportation and the provision of clean energy and low carbon fuelling stations by 2030; ● To reduce reliance on private cars and achieve modal shift to sustainable transportation in conjunction with policies to achieve compact growth and reduce congestion; ● To seek the development of clean energy and lower carbon fuelling and electric vehicle charging stations and infrastructure at appropriate locations in the county which take into consideration electric, hydrogen, CNG/biogas interalia; and ● To support actions to transition the movement of freight, ports and airports to a low carbon future. ● CDP 11.2 Transport Planning: relevant policies are: ● That the overarching goal of transport planning in County Clare is to reduce car dependency and reduce emissions; ● To implement initiatives under the Department of Transport to reduce congestion in urban areas primarily by enhancing sustainable travel options through traffic management, bus priority, urban cycling and urban walking routes; ● To support the reduction in the use of fossil fuels for public transport and increasing use of technology and green energy sources to pursue low emission public transport fleets which is being pursued by the NTA as part of its fleet investment programme; ● CDP 11.15 Proposed Projects identified for Future Development, relevant policies are: ● To integrate climate considerations and risk assessments into the design, planning and construction of all roads, footpaths, bridges, public realm and other construction projects and, where appropriate, to incorporate green infrastructure as a mechanism for carbon offset;	These policies are integrally relevant to the assessment process and have been duly considered unless stated otherwise.

Document Title	Source and Year	Policy Detail	Relevance to Assessment
		● To provide and/or facilitate the projects identified in (CCDP) Table 11.2 where necessary, and to ensure that such road infrastructure is designed and constructed to fulfil its intended purpose and to promote and support active travel; and ● To ensure that all mitigation measures set out in the NIR and SEA contained in (CCDP) Volumes 10(a) and 10(b) are complied with.	
Project Ireland 2040	Government of Ireland website, 2019	The National Development Plan 2021-2030, which makes up part of Project Ireland 2040, includes the Irish Government's strategy for sustainable mobility. Geographically the relevant area is the Mid-West (Southern Regional Assembly) and is composed of several National Strategic Outcomes (NSO's). ● NSO 4: Sustainable Mobility ● This NSO generically covers expanding public transport alternatives, reducing congestion and meeting the transportation demands for a growing population. ● NSO 8: Climate Resilient Society ● Strong reference to ongoing works by EirGrid in relation to Moneypoint to facilitate reductions in green house reductions with the Cross Shannon Cable Project	These policies are integrally relevant to the assessment process and have been duly considered unless stated otherwise.

Source: Government of Ireland & Clare County Council

15.2.2 Guidelines

This assessment has been carried out in accordance with the principles contained within the following key documents:

- Guidelines on the Information to be Contained in Environmental Impact Reports (Environmental Protection Agency,2022)
- Traffic and Transport Assessment Guidelines (Transport Infrastructure Ireland, 2014)
- Guidelines Environmental Assessment of Traffic and Movement (Institute of Environmental Management and Assessment, 2023)
- Rural Road Link Design, (DN-GEO-03031), TII Publications (Transport Infrastructure Ireland, 2017)

The IEMA Guidelines (2023) are intended for the assessment of the effect of road traffic associated with new developments. It is common and established practice that they are applied to energy-related developments and, as such, these guidelines are defined as suitable to assess the construction and operation phases of the proposed development.

A brief overview of core guidance documents used for this assessment is summarised in Appendix I.

15.3 Methodology

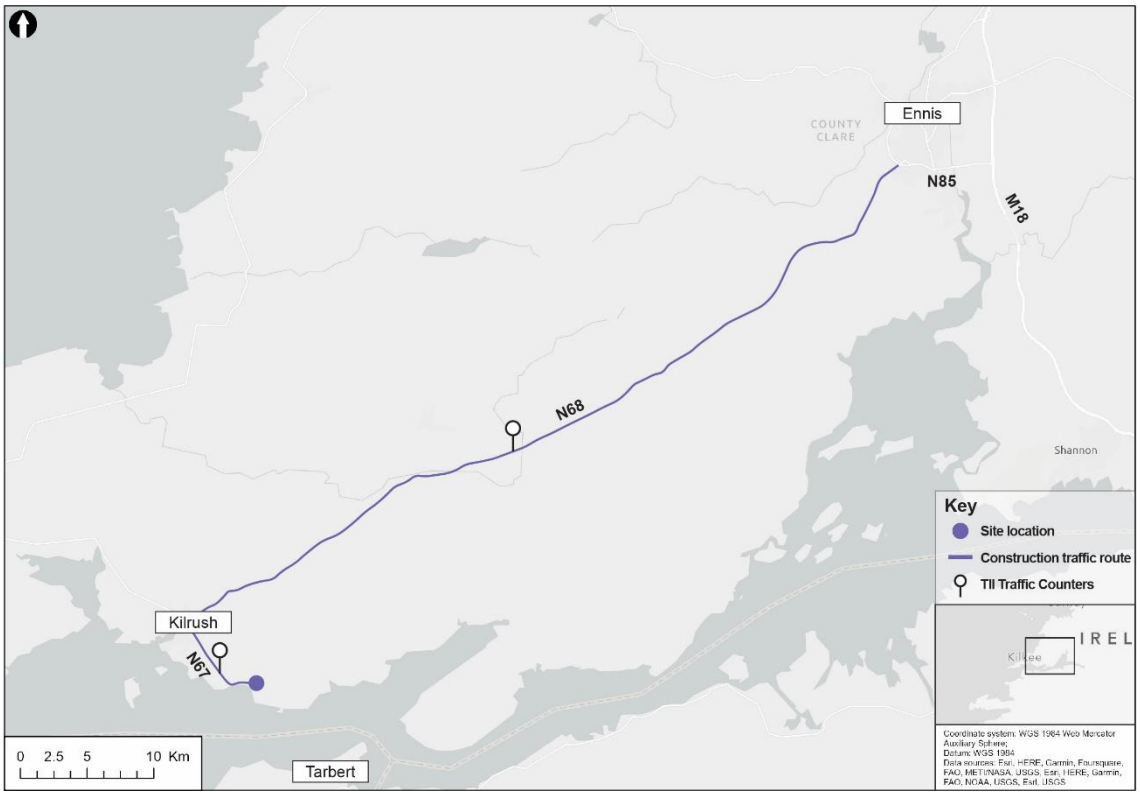
15.3.1 Study Area

The study area for the Traffic and Transport Chapter is effectively the public road network predominantly proposed to accommodate construction traffic generated by the proposed development.

The study area (which is illustrated in Figure 15.1) includes the N67 National Road between the proposed development and the town of Kilrush and the N68 National Road between Kilrush and the town of Ennis and the M18 Motorway (via the N85). A larger version of the study area (Figure 15.1) is provided in Appendix I.

Beyond the study area traffic will subdivide into smaller volumes and professional judgement therefore suggests that effects relating to Traffic and Transport across the wider road network are unlikely to be significant, and therefore not reviewed further in this chapter.

Figure 15.1: Study Area



Source: ESB, TII, Mott MacDonald and ESRI (with various sources, as noted on the plan)

15.3.2 Approach to Data Collection

A desktop study was undertaken to review likely construction traffic routes and to identify constraints and for any potentially sensitive locations i.e., locations which are likely to be more vulnerable to change in traffic flow or profile, e.g., collision clusters, high footfall areas, and/or areas in close proximity to a school.

Data sources for the desktop study include:

- National Transport Model (NToM) Update, Travel Demand Forecasting Report, NToM Volume 3, December 2019, TII, AECOM; and
- TII Traffic Count Data Portal (www.trafficdata.tii.ie).

Data relating to Personal Injury Collisions (PIC) was sought from the Road Safety Authority (RSA) website. However, it is understood that the RSA is in the process of reviewing its collision data sharing policies and procedure and therefore data cannot be shared until this review is complete[150].

15.3.2.1 Existing Traffic Volumes

Traffic volume data regarding national secondary roads was accessed via the TII traffic count data portal. Relative to this assessment, this included the N67 and the N68 with a count on each (for year 2022) as described in Table 15.2 and these are also represented graphically in Figure 15.1. The traffic volume data will include operational traffic from the existing development.

[150] RSA Website, https://www.rsa.ie/road-safety/statistics/road-traffic-collision-data, accessed on 10 November 2023.

Table 15.2: TII Existing Traffic Counters

Location Description	Counter Ref.	Year
N67 Between Kilrush and Moneypoint Generating Station	TMU N67 120.0 E	2022
N68 Between Kilrush and Ennis	TMU N68 030.0 E	2022

Source: Trafficdata.tii.ie

15.3.2.2 Personal Injury Collisions

No assessment of road safety was undertaken as recorded as Personal Injury Collision (PIC) data was unavailable at the time of assessment.

15.3.3 Approach to Impact Assessment

The assessment detailed in this chapter has been undertaken combining desktop study and reference to current policy advice and best practice in line with consultation with statutory agencies. Predicted construction vehicle movements have been compared to baseline traffic flows to identify if there are likely to be periods where the increase in traffic volume, either all traffic or specifically heavy goods vehicle (HGV) traffic, exceed standard thresholds. Such additional traffic has potential to cause detrimental effects, for example, on driver delay, road safety or community (pedestrian delay, non-motorised user (NMU) amenity, fear and intimidation).

15.3.3.1 Significance

The IEMA Guidelines (2023) infer two-fold rules that can be used to determine both the scale and extent of the assessment of road traffic as a screening process:

- Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%).
- Rule 2 – Include highway links of high sensitivity where traffic flows have increased by 10% or more.

It is acknowledged by the IEMA Guidelines (2023) that daily variation can vary +/- 10%. As such, it is assumed that projected changes in traffic below 10% means no discernible environmental impact.

Where the predicted increase in traffic volume (whether general or HGV) falls short of these thresholds, the significance of the effects can be termed as **not significant**. This means that further assessment is not warranted. Consequently, where the predicted traffic flow increase exceeds thresholds, the effects are considered to be potentially **significant** and accordingly, are assessed in greater detail.

The assessment has clearly identified transport routes which are to be used in connection with the proposed development. Quantitative assessments have been undertaken alongside the application of professional judgement to determine whether or not the effects are considered to be of significance. Based on the Rule 1 and 2 of the IEMA Guidelines (2023), the predicted significance of the effect was determined considering both the sensitivity of the receiving environment and the magnitude of change against the baseline. As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in Table 15.3. It should be noted that the assessment considers the effects of the % increase in general traffic (HGV + Light Goods Vehicles (LGV) and cars) and also % increase in HGV traffic only based on related baseline traffic flows e.g., % increase in HGVs from existing HGV baseline flow.

The study area encompasses a predominantly rural area; as such, all routes have been treated as not 'sensitive' and therefore the 30% significance threshold has been applied in view of Rule 1 of the IEMA Guidelines (2023), thereby facilitating a robust assessment.

The thresholds shown in Table 15.3 have been developed based upon the Rule 1 criteria above, as well as the consideration that **Major** and **Moderate** effects are **significant** in the context of Environmental Protection Agency (EPA) Guidelines.

Table 15.3: Effect Significance Matrix

Significance of Effect	% Increase in General Traffic (HGV + LGV) Volume % Increase in HGV Traffic Volume
Major (Significant)	Greater than or equal to 60%
Moderate (Significant)	Greater than or equal to 30% and less than 60%
Minor (Not Significant)	Greater than or equal to 5% and less than 30%
None (Not Significant)	Less than 5%

Source: EPA/IEMA, Mott MacDonald

The significance of all effects under consideration is linked to the volume of traffic generated by the proposed development, therefore it is deemed appropriate to link significance criteria with the scale of the forecast traffic increase. The IEMA Guidelines (2023) also state however that:

"For many effects there are no simple rules or formulae that define appropriate assessment thresholds and therefore there is a need for interpretation and judgement on the part of the competent traffic and movement expect, backed-up by data or quantified information wherever possible."

As such, professional judgement (led by good practice guidance) has also been applied in the assessment of effects so as to provide more meaningful conclusions in particular where it is not quantifiable by set rules or formulae, particularly in relation to driver delay, the assessment of community (pedestrian delay, non-motorised user amenity) and road safety effects. Information of this nature, gathered from desktop research, where available, in addition to technical knowledge from the wider technical team, has also been used.

Furthermore, where baseline traffic flows are very low, it is possible to derive unrealistic determinations of significance when considered against purely numerical assessment criteria. For example, when traffic flow is very low, it is possible to show relatively large traffic increases and for the road to operate well below capacity. Under the numerical criteria defined above, a 60% increase in traffic volume would represent a major effect, but in reality, the effect is likely to be less significant, given the residual capacity of the road.

The following effect classifications are considered;

- Driver delay;
- Road safety; and
- Community effects (pedestrian delay, severance, NMU amenity, fear and intimidation).

The IEMA Guidelines (2023) also necessitate the consideration of Noise, Visual Impact, Air Pollution and Dust and Dirt associated with development generated traffic; these topics are addressed in other chapters of this EIAR. The predicted significance of any potential Traffic and Transport-related environmental impacts has been determined by considering both the sensitivity of the receiving environment and the magnitude of change against the baseline.

The likely duration of an effect is also a relevant consideration and the Environmental Protection Agency have categorised duration of effects in their 2022 Guidelines. Potentially of relevance, in respect of the proposed development, the categories include:

- Brief Effects = Effects lasting less than a day
- Temporary Effects = Effects lasting less than a year
- Short-term Effects = Effects lasting one to seven years

15.3.3.2 Sensitivity

Subject to guidelines from the IEMA, road links may be highlighted as 'specifically sensitive'. In other words, these portions of road are considered to be more vulnerable to changes in either the profile or volume of flows of traffic.

Within the context of this study and using the IEMA Guidelines (2023) for reference, the receptors of sensitivity have been defined in Table 15.4 for various road links using professional judgement and the Design Manuals for Roads and Bridges (DMRB).

Table 15.4: Receptor Sensitivity

Receptor Sensitivity / Importance	Description
High	● Urban/residential roads without pedestrian/cycle facilities that are used by pedestrians
Medium	● Main vehicular route with pedestrian/cycle facilities provided in a built-up area ● Congested Junctions, roads with degree of active frontage
Low	● National roads or 'N' class roads constructed to accommodate significant HGV volumes, Strategic vehicular route, such as Regional Roads, in a rural setting with pedestrian/cycle facilities provided ● Urban road with limited active frontage and pedestrian/cycle facilities provided
Negligible	● Roads with no significant settlements including new strategic national roads or motorways ● Rural road with no/pedestrian cycle facilities provided

Source: UK DMRB LA112/ Mott MacDonald

15.3.3.3 Magnitude

The magnitude of change has been calculated as the proportional change in traffic flow anticipated on each public road section within the study area. This calculation compares the forecast development traffic generation against the baseline traffic during the assumed construction years. It is crucial to ensure that professional judgment is applied in tandem with the criteria stated above; particularly when considering numerical changes in traffic volume.

Additional qualitative criteria have also been employed when assessing magnitude, details of which or provided in Table 15.5. This is of particular importance when considering community effects.

Table 15.5: Magnitude Criteria

Magnitude	Impact
High / Major (Significant)	Where the proposed development could be expected to have a considerable effect (either positive or negative) on receptors
Medium / Moderate (Significant)	Where the proposed development could be expected to have a noticeable effect (either positive or negative) on receptors
Low / Minor (Not Significant)	Where the proposed development could be expected to result in a small, barely noticeable effect (either positive or negative) on receptors
Negligible (Not Significant)	Where no discernible effect is expected as a result of the proposed development on receptors (i.e. the effect is insignificant)

Source: Mott MacDonald

As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic-related effects are set out in Table 15.6 and are based on combining the magnitude of the effect with the receptor sensitivity.

Table 15.6: Significance Assessment Matrix

Magnitude of Change	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High / Major (Significant)	Substantial Adverse	Substantial Adverse	Moderate Adverse	Minor Adverse
Medium / Moderate (Significant)	Substantial Adverse	Moderate Adverse	Minor Adverse	Minor Adverse
Low / Minor (Not Significant)	Moderate Adverse	Minor Adverse	Minor Adverse	Negligible
Negligible (Not Significant)	Minor Adverse	Minor Adverse	Negligible	Negligible

Source: Mott MacDonald

Significance is categorised as Substantial Adverse, Moderate Adverse, Minor Adverse or Negligible. Effects deemed to be Substantial Adverse or Moderate Adverse are considered to be 'Significant' and effects that are judged to be Minor Adverse or Negligible are considered 'Not Significant'. The same criteria also apply to positive/beneficial impacts.

15.3.3.4 Fear and Intimidation

The IEMA Guidelines (2023) include a methodology for assessing magnitude of change for fear and intimidation (caused by all moving objects including traffic). Table 15.7 shows the initial assessment for a road section. The score is then combined, and a level of fear and intimidation is determined from Table 15.8.

Table 15.7: Fear and Intimidation Degree of Hazard

Average Traffic Flow Over 18-Hour Day - All Vehicles/hour 2-way flow (a)	Total 18-hour Heavy Vehicle Flow (b)	Average Vehicle Speed (c)	Degree of Hazard Score
+1800	+3000	>40mph	30
1200-1800	2000-3000	30-40mph	20
600-1200	1000-2000	20-30mph	10
<600	<1000	<20mph	0

Source: IEMA, 2023

Table 15.8: Levels of Fear and Intimidation

Level of Fear and Intimidation	Total Hazard Score (a)+(b)+(c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

Source: IEMA, 2023

The magnitude of change of the effect (compared to baseline conditions) is then calculated as shown in Table 15.9.

Table 15.9: Fear and Intimidation Magnitude of Effect

Magnitude of Effect	Change in Step/Traffic Flows (AADT) from Baseline Conditions
High (Significant)	Two step changes in level
Medium (Significant)	One step change in level, but with ● >400 veh increase in average 18hr AV two-way all vehicle flow; and/or ● >500 HV increase in total 18hr HV flow
Low (Not Significant)	One step change in level, with ● <400 veh increase in average 18hr AV two-way all vehicle flow; and/or ● <500 HV increase in total 18hr HV flow
Negligible (Not Significant)	No change in step changes

Source: IEMA, 2023

15.3.3.5 Traffic Forecasting Assumptions

It has been necessary to make a number of assumptions to enable the traffic and transport assessment to be undertaken. During the COVID pandemic there had been a general trend of reduced motorised traffic on the road, as more people worked from home, travelled on foot and cycled, travelled shorter distances and some shops and services had been closed. Whilst restrictions have been lifted and general trends are moving again it is become difficult to predict when 'normal' travel patterns will resume and/or how patterns of work will change, it is considered robust and reasonable to proceed on the basis of the pre-COVID traffic growth factor applied to future baseline flows.

15.4 Receiving Environment

15.4.1 Road Network and Route Profiles

The road network included in the study area was determined on the basis of likely construction routes defined in Section 15.3.1. Confirmation of route selection will be agreed with the relevant local authorities/TII when a contractor has been appointed as an integral part of the TMP to be approved by Clare County Council (CCC) and adopted by appointed contractor(s).

With reference to the criteria specified in Section 15.3.3 presents the sensitivity of receptors relevant to this assessment on the basis of a road network review.

The key characteristics of the defined public road sections in the Study area have been appraised through desktop study and are set out below in.Table 15.10 Receptor sensitivity has been outlined using the criteria detailed in Table 15.10Table 15.4.

Table 15.10: Road Network and Route Profiles

Route Section	Speed Limit (km/h)	Description	Receptor Sensitivity
N67 (Between Moneypoint Generating Station and Kilrush)	Varies between 50 and 100	National secondary road in the form of a two-way single carriageway. Road section is predominately rural. Links the proposed development site with Kilrush where it links to the N68. Features pedestrian infrastructure in Kilrush.	Low
N68 (Between Kilrush and Ennis)	Varies between 50 and 100	National secondary road in the form of a two-way single carriageway. Road section is predominately rural. Links Kilrush and the N67 to Ennis and the M18 (via the N85). Features pedestrian infrastructure in Kilrush and intermittently between Kilrush and Ennis.	Low

Source: Mott MacDonald

15.4.1.1 Existing Traffic Flows

Theoretical capacities for a variety of road types have been determined through a review of TII Publications, *'Rural Road Link Design' (DN-GEO-03031)*. These capacities are quoted as Average Annual Daily Traffic (AADT).

Table 15.11Table 15.11 details the existing baseline traffic flows and capacities on the routes within the study area considered in the assessment.

Table 15.11: Route Capacities and Existing Baseline Traffic Count Data

Route Section	Road Capacity (AADT)	Existing AADT (two way) All Vehicles	Existing HGV proportion
N67 (Between Moneypoint and Kilrush)	11,600	1342	5%
N68 (Between Ennis & Kilrush)	11,600	4102	4%

Source: Mott MacDonald, TII

15.4.1.2 Tourism and Leisure

The market town of Kilrush is located within the study area approximately 4.5km northwest of proposed development.

Kilrush is one of Ireland's designated heritage towns and features a number of local attractions. The EuroVelo cycle route 1 (EV1) which is part of a network of long-distance cycle routes throughout Europe, passes through the town on both the N67 and the R473.

15.4.1.3 Walking and Cycling

The desktop study identified that walking and cycling infrastructure was evident in the study area.

Footway is present on the east side of the N67 carriageway between Kilrush Shamrocks GAA Club and Kilrush and on both sides of the N67 carriageway for a section between Rock Rd and Fort Rd and within Kilrush town centre.

On the N68 there is footway on both sides of the carriageway within Kilrush. Between Wilson Road and Kilrush Golf Club footway is present on the north side of the carriageway only. Between Kilrush Golf Club and Ennis there is only intermittent footway within settlement areas.

The study area also includes part of a cycle route, EV1, on the N67 within the town of Kilrush. However, there is no dedicated cycling infrastructure associated with cycle route EV1 within the study area.

15.4.1.4 Public Transport

Four bus services utilise the road network in the study area. Table 15.12Table 15.12 summarises the local services and their associated frequencies.

Table 15.12: Local Bus Routes

Route	Route Summary	Weekday Frequency	Weekend Frequency
Regular Rural Service			
339[151]	Between Kilrush, Kilkee and Aill Na Brun (Regular Rural Service)	1. One morning service starting and ending at 9.55am and 11.45am respectively at Turks Bar in Kilrush 2. One afternoon service starting at Aldi in Kilrush at 1.40pm and ending at Turks Bar in Kilrush at 3.50pm.	Same as weekday
336[152]	Between Ennis and Doonbeg via N67, with Kilrush situated to the south of Doonbeg	Every 3 hours starting at 6am and 9am from Doonbeg and Ennis respectively, with an extra shuttle an hour after the first bus.	Every 3 hours
335[153]	Bus 335 utilises two routes in the form of a loop, where the outward and inbound journey of route 2 falls between the route 1 outward and inbound journey. Route 1: Ennis <-> Quilty <-> Kilrush Route 2: Kilrush <-> Doonbeg	Schedule: c) Route 1 Outbound: One morning service beginning in Ennis at 7.20am and ending in Kilrush at 9.30am d) Route 1 Outbound: One morning service beginning in Turk's Bar (Kilrush) at 9.50am and ending in Tesco (Kilrush) at 10.44am (passing Doonbeg at 10.10am) e) Route 2 Inbound: One morning service beginning in Tesco (Kilrush) at 13.38am and ending in Turk's Bar (Kilrush) at 14.35am (passing Doonbeg at 14.05am) f) Route 2 Inbound: One afternoon service beginning in Kilrush at 3.18pm and ending in Ennis at 5.15pm	No service
337[154]	Kilrush via Kildystart and Moneypoint to Ennis and vice-versa, includes (a) weekday service (PN1) and (b) diversion service via Knockerra (PN2)	Overall varying frequency including Saturday between two-four hours, where services start from and at: 1. Turks Bar (Kilrush) at 6.45am every two hours 2. Friars Walk (Ennis) at 10.00am every four hours	Varying frequency on a Sunday only between three-four hours, where services start from and at: Turks Bar (Kilrush) at 08.40am every three-four hours ending at 5.40pm Friars Walk (Ennis) at 10.00am every four hours
Demand Responsive Services [seats to be booked]			
C19[155]	Two routes:	Friday only, schedule:	None

[151] TFI Local Link Limerick Clare, 339 Kilrush to Loop Head: Monday to Sunday – Daily – Local Link Limerick Clare (locallinklc.ie), accessed 25 Oct 23

[152] Bus Éireann, Bus Éireann Timetable Route 336, Ennis - Doonbeg - Bus Éireann - View Ireland Bus and Coach Timetables & Buy Tickets (buseireann.ie), accessed 25 OCT23

[153] TFI Local Link Limerick Clare, 335 Ennis to Kilrush: Monday to Friday – Weekly – Local Link Limerick Clare (locallinklc.ie), accessed 25 Oct 23

[154] TFI Local Link Limerick Clare, 337 Ennis to Kilrush: Monday to Sunday – Daily – Local Link Limerick Clare (locallinklc.ie) accessed 25 Oct 23

[155] TFI Local Link Limerick Clare, C19 Cooraclare – Cappa – Kilrush – Kilbaha: Friday Weekly – Local Link Limerick Clare (locallinklc.ie), accessed 25 Oct 23

Route	Route Summary	Weekday Frequency	Weekend Frequency
Regular Rural Service			
	Route 1: Kilmihil <-> Kilrush Route 2: Kilbaha <-> Kilrush	1. Route 1: Two morning services, between Kilmihil to Kilrush and Kilrush to Cooraclare and one afternoon service from Kilrush to Kilmihil only 2. Route 2: One early afternoon outbound service and one early evening inbound service between Kilbaha and Kilrush	
C26[156]	One route Kilbaha <-> Kilrush Monday	Monday to Saturday, schedule: 1. Outbound morning: Kilbaha to Kilrush starting and ending at 6.25am and 7.26am respectively. 2. Inbound evening: Kilrush to Kilbaha starting and ending at 6.50pm and 7.51pm respectively	Saturday only, see weekday frequency.

Source: Transport for Ireland – Local Link Limerick Clare

[156] TFI Local Link Limerick Clare, C26 Kilbaha to Kilrush: Monday to Saturday – Local Link Limerick Clare (locallinklc.ie), accessed 25 Oct 23

15.5 Likely Significant Impacts

15.5.1 Do Nothing

The 'do nothing' scenario will have no discernible impact on Traffic and Transport, as it is assumed that traffic volumes locally will rise only in line with national traffic growth estimates.

15.5.2 Construction Phase

The assessment of the likely Traffic and Transport effects of the proposed development presented in this section is based on the detail set out in Chapter 4 of this EIAR.

The construction phase is due to commence in September 2024 and is anticipated to last approximately 21 months. It is envisaged that a separate contract will be required to undertake partial dismantling of the coalyard. The dismantling process is expected to take four months.

However, the intensity of traffic will vary over the course of the construction programme. No road closures or lane closures are anticipated throughout the construction phase and therefore there is no requirement for traffic diversion. The indicative construction programme is outlined in Chapter 4.

The partial dismantling of coalyard will generate traffic activity which is much lower in intensity than during the peak construction phase and thus effects will be minor or none[157].

15.5.2.1 Working Hours

Construction works will for the most part take place normal business hours, 07:00-19:00 Monday to Friday, and 08:00-14:00 on Saturday. However, given the urgent need for this project for security of electricity supply there will be a need to undertake some works outside of these times including concrete floating, works inspections and possibly other work.

15.5.2.2 Construction Access

As described in Chapter 4, construction traffic will access the proposed development from the N67 national road via the existing entrance to the operation site.

Heavy Goods Vehicles (HGVs) generated by the proposed development and originating from outside the local area will be required to access the N67 via the N68 and the M18.

15.5.2.3 Construction Personnel

The number of construction personnel required during the construction phase is expected to peak at approximately 90-100 persons. It has been assumed that construction personnel will travel to site using van/minibus or private passenger vehicle (in some cases accommodating more than one occupant).

A vehicle occupancy rate of 1.25 is assumed and in the robust-case scenario this would result in a peak daily requirement of 70-80 vehicles (approximately 140-160 two-way movements per day). This would mean a requirement for up to 80 temporary car parking spaces in a robust case scenario.

Temporary car parking for contractors' vehicles will be provided within the temporary contractor's compound. Temporary signage will also be erected at the entrance to the site.

[157] See Appendix I for indicative traffic calcs

Daily average and Peak daily construction personnel vehicle movements to site are summarised in Table 15.13.Table 15.13: Daily Average and Peak Construction Personnel Vehicle Movements

Table 15.13: Daily Average and Peak Construction Personnel Vehicle Movements[158] [159]

	During Average Construction Operations		During Peak Construction Operations	
Year	**Average Vehicles Per Day**	**Average Vehicle Movements Per Day**	**Peak Vehicles Per Day**	**Peak Vehicle Movements Per Day**
2024	28	55	47	94
2025	46	92	80	16
2026	25	49	36	73

Source: ESB, Mott MacDonald

15.5.2.4 Heavy Goods Vehicle (HGV) Volumes

It is estimated that the peak number of daily HGVs generated by the proposed development will be 17 (34 HGV two-way movements) and that these will occur during peak construction stages which will take place during the main proposed development works.

For the purpose of a robust assessment the following assumptions have been made:

- There will be a maximum of 17 HGVs serving the site during any given day, approximately one-two per hour;
- HGVs will arrive and depart from the site within a given hour, except HGVs carrying equipment (e.g. cranes, pumps).
- Unless specifically stated cranes, platforms and pumps are assumed to be delivered by HGV.
- It should be noted that the estimated peak HGV numbers assume that all soil and stone excavated from the heavy fuel oil (HFO) bund will need to be transported off site, however, it is hoped that a significant portion of this material can be reused within the ESB Moneypoint land holding.

Details of average and peak daily HGV movements during the construction phase are shown in Table 15.14Table 15.16.

Table 15.14: Daily Average and Peak HGVs[160]

	During Average Construction Operations		During Peak Construction Operations[159]	
Year	**Average No. of HGVs Per Day**	**Average HGV Movements Per Day**	**Peak No. of HGVs** Per **Day**	**Peak HGV Movements Per Day**
2024	8	16	16	32
2025	6	11	17	33
2026	2	4	3	6

Source: ESB, Mott MacDonald

[158] Personnel numbers have been rounded.

[159] Peak construction month for HGV and 'All Traffic' differs from peak construction month for personnel numbers.

[160] Vehicle numbers have been rounded.

15.5.2.5 Construction Traffic Summary

Further details regarding the construction phase, including detail on temporary construction compounds/laydown areas are described in Chapter 4.

Details of estimated construction vehicle numbers associated with each construction stage is shown in Table 15.15.

For the purposes of a robust assessment, it has been assumed that all construction traffic uses the N67 and N68.

Table 15.15: Construction Traffic Generation Summary[161]

		2024 Daily Movements		2025 Daily Movements				2026 Daily Movements
		Q3	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**
During Average Construction Operations	Personnel Vehs (Cars)	33	79	79	100	100	88	49
	HGV	1	33	18	10	11	7	4
	All Traffic	34	112	96	110	111	95	54
During Peak Construction Operations	Personnel Vehs (Cars)	40	94	94	103	103	97	73
	HGV	2	32	33	12	13	7	6
	All Traffic	42	127	128	115	116	104	79

Source: ESB, Mott MacDonald

The peak period for construction traffic generation will occur during the Q1 2025.

15.5.2.6 Abnormal Loads

Abnormal loads have been considered separately from general construction traffic for the purposes of assessment.

Vehicles transporting an abnormal load must adhere to the maximum weight limits set down by *Road Traffic (Construction and Use of Vehicles) Regulations 2003, S.I. 5 of 2003* and the maximum height limit set down in *Road Traffic (Construction and Use of Vehicles) (Amendment) Regulations 2008, S.I.366 of 2008*. If any of these thresholds are exceeded, then the load is considered abnormal.

Haulage will be scheduled, as far is reasonably practicable, to occur outside of peak traffic times and the Contractor may be required to arrange a special escort with An Garda Síochána, depending on the size of the loads. Appropriate permits for designated haul routes will be sought and agreed with the Local Authorities during the detailed design phase. It is expected that the auxiliary boilers, boiler stack, cranes, and possible parts of the HFO tanks will be assembled off site and potentially delivered as an abnormal load during the construction phase. However, preference will be for oversized loads to be transported by marine vessel directly to the proposed development site. The precise load arrangements and delivery methods will not be known until construction tender stage is complete.

It is anticipated that there will be one abnormal load delivery per month for a three-month period in Q3/Q4 2025.

[161] Vehicle numbers have been rounded.

15.5.2.7 Future Baseline Traffic Flow

The *Project Appraisal Guidelines for National Roads Unit 5.3, TII, October 2021* has been used to predict local road network traffic flows in the absence of the proposed development.

Low growth of traffic has been assumed given that the study area of the proposed development is sparsely populated. The likelihood of high or medium levels of traffic growth would be used were there to be a drastic increase in car ownership and population in the area during or prior to the construction of the proposed development, which is not foreseen. Table 15.16 summarises future year traffic growth scenarios without the proposed development.

Table 15.16: Future Year Scenario Growth Rates

Future Year Scenario	**Growth Rate from 2022**	
	LGV/Cars	**HGV**
2023	1.39%	4.00%
2024	2.80%	8.20%
2025	4.22%	12.55%
2026	5.68%	17.08%

Source: TII Publications, Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, Table 6.1, October 2021

Table 15.17 lists forecast future baseline traffic flows factored upwards in accordance with the rates indicated in Table 15.16.

Table 15.17: Future Baseline Traffic Flow Data

	2023 Average Daily Traffic Flow		2024 Average Daily Traffic Flow		2025 Average Daily Traffic Flow		2026 Average Daily Traffic Flow	
Route Section	**All Vehicles (Two-Way Flow)**	**HGV Only (Two-Way Flow)**	**All Vehicles (Two-Way Flow)**	**HGV Only (Two-Way Flow)**	**All Vehicles (Two-Way Flow)**	**HGV Only (Two-Way Flow)**	**All Vehicles (Two-Way Flow)**	**HGV Only (Two-Way Flow)**
N67 (Between Moneypoint Generating Station and Kilrush)	1362	67	1383	69	1404	72	1425	75
N68 (Between Kilrush and Ennis)	4163	160	4225	167	4288	173	4352	180

Source: Mott MacDonald, TII

15.5.3 Assessment of Effects of Construction Phase

From Section 15.5.2, the greatest movement of construction vehicles is scheduled during Q3 2025 and therefore year 2025 has been assessed for construction effects on the public road network.

Possible effects associated with the construction works are:

- Driver delay;
- Road safety; and
- Community effects (pedestrian delay, severance, NMU amenity, fear and intimidation).

These effects have potential to be caused due to an increased volume of traffic on the construction vehicle routes, however as these vehicle movements will occur during construction operations only, they are categorised to be short term effects, given the construction period is between one and seven years.

Table 15.18 outlines the significance, in terms of the IEMA thresholds, of the construction vehicle movements on the public road network within the study area in 2025 and assesses the aligned effect significance, using process set out in Section 15.3.

Table 15.18: IEMA Threshold Assessment Summary

Route Section	Capacity (AADT)	Baseline 2025 AADT – All Vehicles (Two-Way Flow)	Baseline 2025 AADT – HGV (Two-Way Flow)	Peak Daily Additional Movements – All Vehicles	% Increase – All Vehicles	Peak Daily Additional Movements - HGVs	% Increase – HGVs	Effect Significance of Increase – All Vehicles	Effect Significance of Increase - HGVs
N67 (Between Moneypoint and Kilrush)	11,600	1404	72	128	9%	33	46%	Minor (Not Significant)	Moderate (Significant)
N68 (Between Ennis & Kilrush)	11,600	4288	173	128	3%	33	19%	None (Not Significant)	Minor (Not Significant)

Source: Mott MacDonald, IEMA, TII

15.5.3.1 Driver Delay

From a review of Table 15.18 the N67 road section highlighted an increase in HGV volumes which, according to IEMA guidelines, trigger the threshold as potentially significant (increase exceeding than 30% for all vehicles or HGVs). The peak HGV volumes will occur for approximately four months and therefore be temporary in the context of EPA Guidelines.

The N67 has the residual capacity to readily accommodate the expected additional traffic flow (construction traffic).

The N67 features low existing HGV volumes and as such show a relatively large proportional increase which would represent a major effect.

All abnormal loads will be transported outside of peak traffic periods, and it is therefore probable that associated disruption to road network operation will be minimal and therefore not significant in terms of the EPA Regulations.

On this basis, implementing professional judgement, the significance of effect of driver delay for users of the N67 and N68 is considered to be **minor** and accordingly considered to be **not significant** in the context of the EIAR Guidelines.

15.5.3.2 Road Safety

Implementing professional judgement, given there will be no significant traffic increase associated with the proposed development, road safety concerns are therefore not considered to be significant in terms of the *EIAR Guidelines*.

15.5.3.3 Community Effects (Pedestrian Delay, Severance, NMU Amenity, Fear and Intimidation)

The IEMA Guidelines (2023) define severance as ‘the perceived division that can occur within a community when it becomes separated by major transport infrastructure’. Severance may result from a road carrying large traffic flows or a physical barrier created by the road itself, and the IEMA Guidelines (2023) suggest that consideration is given to the severity of existing severance and how this might be exacerbated by proposed construction traffic generated by a development. As shown in Table 15.18, the roads in the study area will not be significantly impacted by the addition of traffic generated by construction of the proposed development. Table 15.11 referenced theoretical capacities (AADT) for each of the roads in the study area and indicated that baseline traffic flows were well within the roads’ theoretical capacity. Severance should not occur when there is such a notable level of residual road capacity and traffic generated by the proposed development will be relatively low.

For similar reasoning, pedestrian delay is not considered to be an existing problem on any of the route sections within proposed development study area, nor one that shall be created by the addition of proposed construction traffic to these routes.

Non-motorised user (NMU) amenity is broadly defined by the IEMA Guidelines (2023) as the ‘relative pleasantness of a journey’. The IEMA Guidelines (2023) suggest that ‘a tentative threshold for judging the significance of changes in pedestrian amenity would be where traffic flows (or its HGV component) are halved or doubled. The construction phase of the proposed development is predicted to generate increased HGV flows on roads within the study area, with up to 17 HGV movements per day occurring during the peak construction period (an increase of c.47% for HGVs on the N67 in year 2025).

On this basis, the significance of the effect on pedestrian amenity, is considered to be at worst **minor** and accordingly considered to be **not significant** in terms of the EIAR Guidelines.

Fear and Intimidation

As referenced in Section 15.3, the IEMA Guidelines (2023) include a new methodology for assessing magnitude of change for fear and intimidation (caused by all moving objects including traffic).

Fear and intimidation have been assessed for the peak level of construction traffic in year 2025. Table 15.19 shows the 2025 future baseline assessment and Table 15.20 shows the "with construction traffic" assessment with a reference to the fear and intimidation magnitude of impact.

Table 15.19: Fear and Intimidation Assessment – 2025 Future Baseline

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
N67 (Between Moneypoint and Kilrush)	1389 [20]	72 [0]	>40mph [30]	50	Great
N68 (Between Ennis & Kilrush)	4202 [30]	173 [0]	>40mph [30]	60	Great

Source: IEMA, Mott MacDonald, TII

Table 15.20: Fear and Intimidation Assessment – 2025 "With Construction Traffic"

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
N67 (Between Moneypoint and Kilrush)	1517 [20]	105 [0]	>40mph [30]	50	Great	Negligible (No Change)
N68 (Between Ennis & Kilrush)	4330 [30]	207 [0]	>40mph [30]	60	Great	Negligible (No Change)

Source: IEMA, Mott MacDonald, TII

As shown in Table 15.20 the magnitude of impact is negligible (no change) with reference to IEMA Guidelines (2023).

Therefore, the significance of the effect on fear and intimidation, is considered to be negligible and accordingly considered to be **not significant** in terms of the EIAR Guidelines.

Community Effects Summary

Overall, based on professional judgement, the construction traffic generated by proposed development will have a **minor** effect upon community receptors and is therefore **not significant** in the context of the EIAR Guidelines.

15.5.4 Operation and Maintenance Phase

The operation and maintenance phase has been scoped out of the Traffic and Transport assessment as operational traffic volumes for the proposed development will be similar to those associated with the existing development. Detail on the operation and maintenance phase can be found in Chapter 4.

15.5.5 Decommissioning Phase

When future decommissioning should occur (in part or whole) then it is probable that the associated traffic generation will be at worst similar to that which would be generated during the construction phase.

15.5.6 Cumulative Effects

A number of developments, most of which are committed in terms of planning, are located close to the proposed development. These developments are listed in Table 15.21 with associated commentary on their inclusion in the cumulative assessment provided. Further information regarding each of these developments can be found in Section 5.5.9.

Table 15.21: Adjacent Development Proposals

Reference (Planning/Other)	Date Granted	Scoped In/Out & Justification/Details
Kerry CC: 13138	21/10/2013	Scoped Out Construction traffic/works: No roads in study area.
Kerry CC: 13477	25/10/2013	Scoped Out Understood to be built and fully operational.
Kerry CC: 115	08/04/2015	Scoped Out Understood to be built and fully operational.
Kerry CC: 139138	18/06/2018	Scoped Out Extension granted. Expires 20/10/2023. Construction traffic/works: No roads in study area.
Kerry CC: 139477	18/02/2019	Scoped Out Understood to be built and fully operational.
Kerry CC: 18392	18/02/2019	Scoped Out Construction traffic/works: No roads in study area.
Clare CC: 19746	20/11/2019	Scoped In Project is in close proximity to the proposed development and/or affected roads within Study area.
ABP: 305739 Kerry CC: 18878	10/2/2020	Scoped Out Construction traffic/works: No roads in study area.
Kerry CC: 19115	12/03/2020	Scoped Out Construction traffic/works: No roads in study area.
Clare CC 20318	16/07/2020	Scoped Out Understood to be built and fully operational.
Kerry CC: 20850	16/12/2020	Scoped Out Construction traffic/works: No roads in study area.
ABP: 307798-20	04/06/2021	Scoped In

Reference (Planning/Other)	Date Granted	Scoped In/Out & Justification/Details
		Project is in close proximity to the proposed development and/or affected roads within study area.
ABP: 308643	21/06/2021	Scoped Out Construction traffic/works: No roads in study area
Kerry CC: 21549	20/08/2021	Scoped Out Construction traffic/works: No roads in study area.
ABP: 310521	29/11/2021	Scoped Out Application for retention of existing structure so likely no or negligible associated traffic.
ABP: 315838	14/04/2023	Scoped Out Construction traffic/works: No roads in study area.
Kerry CC: 23350	Further Information Req. 24/5/2023 Republication required 04/10/2023	Scoped In Project is in close proximity to the proposed development and/or affected roads within study area.

Source: Varies by Development

Based on a review of the information available and applied professional judgement, the following developments have been considered for cumulative assessment:

- Clare CC: 19746
- ABP: 307798-20
- Kerry CC: 23350

The (considered cumulatively) developments project data has been reviewed and is summarised in Table 15.22.

Due to limited information available publicly, the following assumptions have been made:

- Kerry CC: 23350 – Only construction traffic impact from Kilkerin Point site has been considered as it has been assumed that there would be no traffic impact from the Tarbert Generating Station site (due to location).
- ABP: 307798-20 – Only construction traffic on the Moneypoint side of the Shannon Estuary has been considered as it has been assumed that there would be no traffic impact from the Tarbert side (due to location). Assumed construction traffic distributed evenly to each side of the Shannon Estuary. It has been assumed that all construction personnel drive (single occupancy vehicles).

Table 15.22: The Proposed Development and Cumulative Development Effects

Route Section	Road Capacity (AADT)	Cumulative Development Additional Vehicle Movements During Construction Period (Two-way)	% Increase – All Vehicles	Cumulative Development Additional HGV Movements During Construction Period (Two-way)	% Increase – HGVs	Proposed Development + Cumulative Development Additional Vehicle Movements During Proposed Development Peak Construction Period (Two-way)	% Increase – All Vehicles	Proposed Development + Cumulative Development Additional HGV Movements During Proposed Development Peak Construction Period (Two-way)	% Increase – HGVs	Effect Significance of Increase – All Vehicles	Effect Significant of Increase - HGVs
N67 (Between Moneypoint and Kilrush)	11,600	122	9%	45	62%	250	18%	78	109%	Minor (Not Significant)	Major (Significant)
N68 (Between Ennis & Kilrush)	11,600	217	5%	77	44%	345	8%	110	64%	Minor (Not Significant)	Major (Significant)

Source: Varies by Development

15.5.6.1 Driver Delay

From a review of Table 15.22 all road sections highlighted an increase in HGV volumes which, according to IEMA Guidelines (2023), trigger the threshold as potentially significant (increase exceeding than 30% for all vehicles or HGVs).

The N67 and N68 have the residual capacity to readily accommodate the expected additional traffic flow (cumulative construction traffic).

The N67 and N68 feature low existing HGV volumes and as such show a relatively large proportional increase which would represent a major effect.

On this basis, implementing professional judgement, the significance of effect of driver delay for users of the N67 and N68 is considered to be **minor** and accordingly considered to be **not significant** in the context of the EIAR Guidelines.

15.5.6.2 Road Safety

Implementing professional judgement, given there is no significant traffic (all traffic) increase associated with the proposed development and cumulative development, road safety is therefore not considered to be significant in terms of the EIAR Guidelines.

Therefore, the significance of effect of road safety for users of the N67 and N68 is considered to be **minor** and accordingly considered to be **not significant** in the context of the EIAR Guidelines.

15.5.6.3 Community Effects (Pedestrian Delay, Severance, NMU Amenity, Fear and Intimidation)

Table 15.11 referenced theoretical capacities (AADT) for each of the roads in the study area and indicated that baseline traffic flows were well within the roads' theoretical capacity. Severance should not occur when there is such a notable level of residual road capacity and construction traffic generated by the proposed development and cumulative development will be relatively low.

For similar reasoning, pedestrian delay is not considered to be an existing problem on any of the route sections within proposed scheme study area, nor one that shall be created by the addition of proposed construction traffic (associated with the proposed development and cumulative development) to these routes.

Non-motorised user (NMU) amenity is broadly defined by the *IEMA Guidelines* as the 'relative pleasantness of a journey'. The IEMA Guidelines (2023) suggest that 'a tentative threshold for judging the significance of changes in pedestrian amenity would be where traffic flow (or its HGV component) is halved or doubled.

Construction traffic associated with the proposed development with the cumulative development is predicted to generate increased HGV flows on the roads within the study area, with up to 78 additional HGV movements per day on the N67 and up to 110 additional HGV movements per day on the N68 occurring during the peak construction period (an increase of c.109% for HGVs on the N67 in year 2025 and an increase of 64% of HGVs on the N68 in year 2025).

As previously noted, the N67 and N68 have relatively low HGV flow and as such show a relatively large proportional increase which would represent a major effect.

HGV flows on the N67 are predicted to double in 2025 however the majority of the N67 section in the study area is rural and does not form part of any recreational route. The urban section within Kilrush features various pedestrian infrastructure and also a low (50 kph) speed limit.

Fear and Intimidation

Fear and intimidation have been assessed for construction traffic associated with the proposed development with the cumulative development. Table 15.23 shows the 2025 future baseline assessment and Table 15.24 shows the "with construction traffic (Proposed Development and Cumulative Development)" assessment with a reference to the fear and intimidation magnitude of impact.

Table 15.23: Fear and Intimidation Assessment – 2025 Future Baseline

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation
N67 (Between Moneypoint and Kilrush)	1389 [20]	72 [0]	>40mph [30]	50	Great
N68 (Between Ennis & Kilrush)	4202 [30]	173 [0]	>40mph [30]	60	Great

Source: IEMA, Mott MacDonald, TII

Table 15.24: Fear and Intimidation Assessment – 2025 "With Construction Traffic (Proposed Development and Cumulative Development)"

Road Section	Average Traffic Flow (18 hours) – All Vehicles (Two-way Flow) [DEGREE OF HAZARD SCORE]	HGVs (24 hours) – (Two-way Flow) [DEGREE OF HAZARD SCORE]	Average Vehicle Speed [DEGREE OF HAZARD SCORE]	Total Degree of Hazard Score	Level of Fear and Intimidation	Fear and Intimidation Magnitude of Impact
N67 (Between Moneypoint and Kilrush)	1639 [20]	150 [0]	>40mph [30]	50	Great	Negligible (No Change)
N68 (Between Ennis & Kilrush)	4547 [30]	284 [0]	>40mph [30]	60	Great	Negligible (No Change)

Source: IEMA, Mott MacDonald, TII

As shown in Table 15.24 the magnitude of impact is negligible (no change) with reference to IEMA Guidelines (2023).

Community Effects Summary

Overall, based on professional judgement, the construction traffic generated by proposed development with the cumulative development will have a **minor** effect upon community receptors and is therefore **not significant** in the context of the EIAR Guidelines.

15.6 Mitigation and Monitoring Measures

The temporary effects of construction, regardless of the assessed level of significance, will be mitigated through adoption of a regulated and approved Traffic Management Plan (TMP).

The general purpose of a TMP is optimise the efficiency and safety of all traffic activities generated by the proposed development and thus maintain suitable amenity and safety for local communities and other roads users.

Operational traffic associated with the proposed development will be similar to that of the existing development. Nonetheless, it is recognised as good practice to implement a Workplace Travel Plan (WTP) to promote sustainable transport use and discourage single vehicle occupancy travel.

15.6.1 Traffic Management Plan (TMP)

A summary of key TMP monitoring elements follow; the TMP is provided in full in the Construction Environmental Management Plan (CEMP) in Appendix C.

The assessment of post-mitigation effects has been undertaken on the assumption that key measures set out in the TMP will be developed as appropriate by the appointed contractor and be implemented during the proposed development construction phase.

The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Clare Co Co, the appointed contractor, TII and/or their Agents and An Garda Síochána as appropriate. Construction activity generated vehicles (with the exception of site personnel in cars and vans) will travel on pre-defined routes to and from the relevant sites to reduce effects on existing local traffic.

The TMP has been developed for the purposes of this assessment and will be updated as necessary in consultation with Clare Co Co and the Gardai prior to construction commencing. The TMP will document measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services. The TMP will be considered a ‘live’ document and will be developed accordingly, within the parameters assessed in this EIAR.

During the construction phase, signage will be installed to warn road and recreational route users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.

Car sharing will be promoted to construction personnel by the contractor during the induction process.

In order to reduce the potential for mud and other debris being deposited onto the local road network in the vicinity of worksite accesses, wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite, and remote from watercourses. This will minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the nearest public road will be kept clear of debris by monitoring and then utilising a road sweeper where necessary.

The appointed contractor could employ a number of sub-contractors, and all will fall under the umbrella of the TMP and will have an obligation to adhere to the Plan; this obligation will form part of the procurement process and will be written into any contract of employment.

Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures set out in the TMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors.

The appointed Contractor will nominate a person to be responsible for the co-ordination of all elements of traffic and transport, except community liaison during the construction process, a nominated Liaison Officer.

ESB will appoint a Community Liaison Contact. The Community Liaison Contact will be the direct point of contact for the developer organisation with the local community. Accordingly, local residents and business holders can contact the Community Liaison Contact for general information purposes or to discuss specific matters pertaining to traffic management or site operation.

The Community Liaison Contact will regularly liaise with the nominated Liaison Officer.

If the construction phase of any notably sized development(s) appears likely to overlap with the proposed development, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction. Prior to commencement of construction, and during the construction phase, engagement with the proponents of other developments will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts on population and human health are minimised. The specific detail will be developed by the appointed contractor within the parameters assessed in this EIAR.

15.6.2 Workplace Travel Plan (WTP)

This WTP Framework will be implemented with focus on employees associated with the operation of the proposed development. The WTP will be further developed with reference to national travel planning guidance including National Transport Authority's "Workplace Travel Plan – A Guide for Implementers" (2022).

The aim of the WTP within the planning process is to contribute towards sustainable development by enabling sustainable travel opportunities to new developments; objectives will therefore be developed with these aims in mind.

The following primary objectives have been identified:

- Maximise the use of sustainable transport modes of travel by employees on their journey to and from site;
- Minimise traffic impact of the proposed development through minimising car travel (particularly single occupancy car travel and travel during peak hours) of employees on their journey to and from the site;
- Contribute positively to the local environment through the implementation of sustainable transport initiatives; and
- Deliver an ongoing commitment to sustainable transport issues at the site, with comprehensive monitoring that leads to regular review of targets and measures.

Key measures in the WTP include:

- Workplace travel plan surveys to monitor modal shift
- New starter information packs provided for all new employees including up to date travel information and advice on sustainable travel.

- Promotion of car sharing between employees.
- Public transport promotion
- Promotion of sustainable travel such as EV and e-bikes.

A Travel Plan Co-ordinator (TPC) will be appointed to administer the implementation and ongoing monitoring of the Travel Plan.

It is envisaged that this WTP will be developed and consolidated, as necessary, with any existing Workplace Travel Plan arrangements prior to the commencement of operation.

Workplace travel associated with construction traffic (during the construction phase) will be covered in the TMP.

15.7 Residual Impacts

The assessment of post-mitigation effects has been undertaken on the assumption that key measures set out in the TMP will be developed as appropriate by the appointed contractor and be implemented during the proposed development construction phase.

In the context of the *EIAR Guidelines* there are no significant residual Traffic and Transport impacts predicted during the construction phase, and this will be assured through the incorporation of measures described within the TMP.

16 Material Assets and Waste Management

16.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on material assets and waste management. The assessment is based for the development as described in Chapter 4 of this EIAR.

16.2 Policy and Guidance

The Planning Report (Ref: 229101323_401 | 5) which accompanies this application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Material Assets and Waste Management are set out in this section.

These policy and guidance documents have been used to inform this chapter of the EIAR.

16.2.1 Legislation and Polices

The following legislation is relevant to this waste assessment.

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives, Waste Framework Directive (WFD)
- Environmental Protection Agency Act 1992 (as amended)
- Protection of the Environment Act 2003 (as amended)
- Environmental (Miscellaneous Provisions) Acts 2011 and 2015
- Waste Management Act 1996 (as amended)
- Waste Management (Facility Permit and Registration) Regulations 2007 (as amended)
- Waste Management (Collection) Regulations 2007 (as amended)
- European Communities (Waste Directive) Regulations 2011
- A Waste Action Plan for a Circular Economy 2020-2025 (DECC 2020)
- National Hazardous Waste Management Plan 2021-2027, Environment Protection Agency (EPA), 2021
- The Southern Region Waste Management Plan 2015 – 2021 (Southern Waste Region, 2015)
- Construction and demolition waste – Soil and stone recovery/disposal capacity (Update Report 2020) Eastern Midlands region, Connacht Ulster region and Southern region (Government of Ireland, 2020)

16.2.2 Guidelines

The following guidelines are relevant to this assessment.

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021)
- A Waste Action Plan for a Circular Economy: Ireland’s National Waste Policy 2020-2025
- Institute of Environmental Management and Assessment (IEMA, 2020). Best practices for material and waste environmental impact assessments

- Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous (EPA, 2019)
- Design Out Waste: A Design Team Guide to Waste Reduction in Construction and Demolition Projects (EPA, 2015)

16.3 Methodology

16.3.1 Approach to Data Collection

The following information and data sources (Table 16.1) have been considered during the production of this EIAR.

Table 16.1 Data Sources used to inform the Material Assets and Waste Management chapter of this EIAR

Data source	Date	Data contents
EPA	2022	Licensed waste facilities
ESB Resources and Waste Inventory	2023	• Materials required for construction • Materials required for operation • Waste arising from the project • Materials from the cut and fill balance
RVA* Demolition Estimate	2023	Waste arising from partial dismantling of coalyard, and demolition activities post 2029

* RVA Group, on behalf of ESB, prepared an estimate of materials arising from decommissioning of Moneypoint Generating Station coal handling plant.

16.3.2 Approach to Impact Assessment

The construction, operation and maintenance, and decommissioning of any infrastructure can result in environmental effects associated with the consumption and use of materials assets, and the management of waste that is generated. The assessment is in line with the EIA Directive, identify, describe and assess the likely significant effects of proposed projects on the environment resulting from the expected residues and emissions and the production of waste.

The assessment methodology is in line with the requirements set out in the EPA Guidelines 2022. The assessment for material assets and waste considers the following:

- Types and quantities of materials required to be consumed within the proposed development, where known.
- Details of the source or origin of materials, site-won materials to replace virgin materials, materials from secondary or recycled sources, or virgin or non-renewable sources, if known.
- Cut and fill balance.
- Forecast of non-hazardous, hazardous and inert waste arisings.
- Surplus materials and waste falling under regulatory controls.
- Wastes that require storage on-site prior to reuse, recycling and disposal.
- Wastes to be pre-treated on-site for reuse within the proposed development, if known.
- Wastes requiring treatment or disposal off-site.
- The impacts that will arise from the issues identified in relation to materials and waste.
- Identification of mitigation measures based on identified impacts.
- Conclusion based on nature and magnitude of impacts.

The categories for the significance of effects defined in the EPA Guidelines 2022 and reproduced in Figure 5.1 in Chapter 5 of this EIAR.

Professional judgement based on suitable Ireland-specific and IEMA guidance for the assessment of materials and waste in EIA has been used to assist in the assessment, considered to be good practice and are applicable in a global setting.

To determine the significance of effect, a comparison of IEMA guidance is assessed against the EPA Guidelines 2022, which is provided below.

The IEMA has developed a guidance for the assessment of materials and waste in EIA. The IEMA document provides guidance for assessing the impacts and effects of material assets and waste management in an EIA process and will be used to complement EPA Guidelines 2022. Significance of effects for sensitivity (Table 16.2) and for magnitude (Table 16.3) will be used to provide a more comprehensive assessment for materials assets and waste.

According to IEMA guidance, for waste generation, the assessment for the effect of magnitude, for the proposed development will be based on the void capacity method as:

- The proposed development is a complex development
- It is a robust approach based on availability of industry data
- It is a detailed methodology

Table 16.2: IEMA guidance for sensitivity for material assets use and waste generation

Significance Category	Description
Negligible	● Material assets for the key materials required for the construction and/or operation of a development: ● are forecast (through trend and analysis and other information) to be free from known issues regarding supply and stock; and/or ● are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials. ● sustainable features and benefit could include materials or products that comprise reuse, secondary or recycled content (including excavated and other arisings), support the drive to a circular economy or in some other way reduce lifetime environmental impacts. ● Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): ● inert, non-hazardous, and hazardous landfill capacity void is expected to remain unchanged or is expected to increase through a committed change in capacity; and ● hazardous and hazardous landfill capacity void is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	● Material assets for the key materials required for the construction and/or operation of a development: ● are forecast (through trend and analysis and other information) to be generally free from known issues regarding supply and stock; and/or ● are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials. ● Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): ● inert and non-hazardous landfill capacity void is expected to reduce minimally by <1% as a result of waste forecast; and/or ● hazardous landfill capacity void is expected to reduce minimally by <0.1% as a result of waste forecast;
Medium	● Material assets for the key materials required for the construction and/or operation of a development: ● are forecast (through trend and analysis and other information) to suffer from some potential issues regarding supply and stock; and/or ● are available comprising some sustainable features and benefits compared to industry-standard materials.

Significance Category	Description
	● Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): ● inert and non-hazardous landfill capacity void is expected to reduce noticeably by 1-5% as a result of waste forecast; and/or ● hazardous landfill capacity void is expected to reduce noticeably by 0.1- 0.5% as a result of waste forecast.
High	● Material assets for the key materials required for the construction and/or operation of a development: ● are forecast (through trend and analysis and other information) to suffer from some potential issues regarding supply and stock; and/or ● comprise little or no sustainable features and benefits compared to industry-standard materials. ● Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): ● inert and non-hazardous landfill capacity void is expected to reduce considerably by 6-10% as a result of wastes forecast; and/or ● hazardous landfill capacity void is expected to reduce considerably by 0.5 - 1% as a result of wastes forecast.
Very High	● Material assets for the key materials required for the construction and/or operation of a development: ● are known to be insufficient in terms of production, supply and/or stock; and/or ● comprise no sustainable features and benefits compared to industry-standard materials. ● Waste generation across construction and/or operation phases, the baseline/future baseline of regional (or where justified, national): ● inert and non-hazardous landfill capacity void is expected to reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand; and/or ● hazardous landfill capacity void is expected to reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.

Source: IEMA, 2020

Table 16.3: IEMA guidance for magnitude of impact for material assets use and waste management

Significance	Description
No change	Material assets: no materials required Waste generation: ● based on void capacity: for inert, non – hazardous and hazardous waste, zero waste generation and disposal from the development. ● based on landfill diversion in construction and/or operation, a development is expected to achieve 100% landfill diversion.
Negligible	Material assets: no individual material type is equal to or greater than 1% by volume of the regional or where justified national baseline availability Waste generation: ● based on void capacity, the development will reduce: – regional or where justified national landfill void capacity baseline for inert and non – hazardous by <1%; and/or – national landfill void capacity baseline for hazardous waste by <0.1%. ● based on landfill diversion in construction and/or operation, a development is expected to achieve 90-99% landfill diversion.
Minor	Material assets: ● one or more materials is between 1-5% by volume of the regional or where justified national baseline availability; and/or

Significance	Description
	● the development has the potential to adversely and substantially* impact access to one or more allocated mineral site (in their entirety), placing their future use at risk. Waste generation: ● based on void capacity, the development will reduce: – regional or where justified national landfill void capacity baseline for inert and non – hazardous by 1-5%; and/or – national landfill void capacity baseline for hazardous waste by <0.1-0.5%. ● based on landfill diversion in construction and/or operation, a development is expected to achieve 60-89% landfill diversion.
Moderate	Material assets: ● one or more materials is between 6-10% by volume of the regional or where justified national baseline availability; and/or ● the allocated mineral site is substantially* sterilised by the development rendering it inaccessible for future use. Waste generation: ● based on void capacity, the development will reduce: – regional or where justified national landfill void capacity baseline for inert and non – hazardous by 6-10%. – national landfill void capacity baseline for hazardous waste by <0.5-1%; ● based on landfill diversion in construction and/or operation, a development is expected to achieve 30-59% landfill diversion.
Major	Material assets: ● one or more materials is >10% by volume of the regional or where justified, national baseline availability; and/or ● more than one allocated mineral site is substantially* sterilised by the development rendering it inaccessible for future use. Waste generation: ● based on void capacity, the development will reduce: – regional or where justified national landfill void capacity baseline for inert and non – hazardous by >10%; – national landfill void capacity baseline# for hazardous waste by >1%; ● based on landfill diversion in construction and/or operation, a development is expected to achieve <30% landfill diversion.

Source: IEMA, 2020 Note: *Justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed.

The effects threshold defined by IEMA are presented in Table 16.4; while the environmental effect based on the effect threshold are presented in Table 16.5.

Table 16.4: Effect threshold defined by IEMA

		Magnitude of impact				
		No change	Negligible	Minor	Moderate	Major
Sensitivity (or value) of receptor	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight of moderate	Moderate or large	Large or very large
	Medium	Neutral	Slight	Slight	Moderate	Moderate or large
	Low	Neutral	Slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Slight	Neutral or slight	Neutral or slight	Slight

Source: IEMA, 2020

Table 16.5: The environmental effect based on the effect threshold used by IEMA

Effect	Materials	Waste
Neutral	Not significant	Not significant
Slight		
Moderate	Significant	Significant
Large		
Very large		

Source: IEMA, 2020

However, not all categories for significance of sensitivity and magnitude align with the categories outlined in EPA Guidelines 2022. Therefore, for each category outlined in the IEMA guidance a suitable corresponding category from the EPA Guidelines 2022 has been assigned. These are detailed in Table 16.6 for sensitivity of effect and Table 16.7 for magnitude of effect.

Table 16.6: Suitable corresponding categories between IEMA and EPA guidelines for sensitivity of effect

Significance category in IEMA	Significance category in EPA guidelines 2022
Negligible	Negligible
Low	Low
Medium	Medium
High	High
Very high	

Source: Mott MacDonald based on IEMA and EPA, 2022

Table 16.7: Suitable corresponding categories between IEMA and EPA guidelines for magnitude of effect

Significance category in IEMA	Significance category in EPA guidelines 2022
No change	Negligible
Negligible	
Minor	Low
Moderate	Medium
Major	High

Source: Mott MacDonald based on IEMA and EPA, 2022

The corresponding significance category in EPA Guidelines 2022 will be assessed against the predicted significance of effect as set out in Chapter 5 Methodology of this EIAR (Figure 5.1). A corresponding suitable environmental effect category has been aligned in Table 16.8 between EPA's 2022 predicted significance of effect and IEMA's environmental effect.

Table 16.8: Suitable environmental effect categories for the EIAR

Effect, by EPA 2022	Effect, by IEMA	Materials	Waste
Imperceptible	Neutral	Not Significant	Not Significant
Not significant			
Slight	Slight		
Moderate	Moderate	Significant	Significant
Significant	Large		
Very Significant	Very large		
Profound			

Source: Mott MacDonald based on IEMA and EPA, 2022

The assessment of effects on material assets and waste generation will encompass effects arising during construction and operation phases of the proposed development. The construction phase includes excavation and demolition activities as part of site preparation works, and partial dismantling of the coalyard after coal burning ceases.

Professional judgement will be used to provide an assessment of effects based on several factors, including:

- The availability of the material assets.
- The type of materials required, e.g. primary or virgin materials, manufactured materials, recycled materials.
- The type of waste generated, e.g. inert, non-hazardous or hazardous.
- The availability of suitable facilities within close proximity to the proposed development to treat the waste generated.
- Compatibility of the Best Practicable Environmental Option (BPEO) for the waste within the context of the waste hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.

The potential impacts on the receptors which will be assessed in the EIAR are listed below:

- The reduced availability of material resources and the subsequent impact on the demand for materials.
- The depletion of non-renewable resources.
- Temporary occupation of waste management infrastructure capacity.
- Permanent reduction in landfill capacity.

Significant environmental effects are more likely to arise from those materials, or wastes, which:

- Are associated with the largest quantities.
- Are primary or virgin materials.
- Have hazardous properties.

The scope of assessment for EIAR includes the construction phase of the proposed development, as described in Chapter 4. It also includes a qualitative assessment of the potential effects from the proposed modification of the existing permitted Flue Gas Desulphurisation (FGD) and Ash Storage Area (ASA) arrangements. As described in Section 3.5, by June 2023 there were 1.3 million m^3 of remaining capacity in the ASA. The modifications to the FGD and ASA aim to utilise this spare capacity in the existing ASA to store the FGD by-product once the Landfill Area A reaches full capacity. This is anticipated to be possible as a result of a reduction of ash concentration of HFO combustion. In addition, the thickness of the cap in the ASA is to be modified. The thickness of the FGD/Ash capping layer will be increased from 0.6m up to a maximum of 1.6m. The spare capacity will be used to store all the FGD by-product produced between 2025 and 2029.

16.3.2.1 Assumption and Limitations of this EIAR

The assessment is based on desktop information and design information available for the proposed development at the time of drafting the report. Field surveys were not required for the assessment of material assets and waste management. Baseline information and potential impacts identified are based on publicly available information.

The assessment does not consider the environmental effects associated with the off-site extraction of raw materials used for the off-site manufacture of products. These stages of the products or materials' lifecycles are outside of the scope of the assessment due to the range of unknown variables associated with the processes involved and are not considered to form part

of the proposed development. In most cases, it can also be assumed that these processes would have already been subject to EIAs in securing consents for the facilities' operation.

This assessment has not assessed the impact of material assets use and waste associated with the manufactured goods required by the proposed development as these will be subject to their own separate consenting and regulatory controls at the place of production.

The quantities of material assets available at the time of submission for the proposed development (Resources and Waste Inventory, ESB 2023), has been used to forecast and assess the material assets required for the proposed development and the waste that may be generated by the proposed development. These forecasts are likely to be refined and subject to change as the proposed development design progresses. For that reason, the forecasts have been made on a reasonable worst-case scenario basis, informed by professional judgement.

Materials classed as bulk material in the quantities of material assets available at the time of submission, are assumed to comprise either of sand and gravel or crushed rock as main component. Therefore, they will be classed accordingly as such for the materials assessment.

Cut volumes for stone, concrete and rebar as stated in the quantities of material assets available at the time of submission, under the name of 'Excavation', are assumed to arise from demolition activities associated with proposed site preparation works.

Based on professional judgment and based on a worst-case scenario, it has been assumed that 10% of material assets brought to the site required for the construction of the proposed development may become waste due to damages, off-cuts or surpluses.

The procurement strategy for the materials required for the construction of the proposed development is unknown at this stage. For the purposes of the assessment, it is assumed that, not all materials would be available to be sourced locally (within Munster), and that the majority would be sourced nationally (within Ireland). This will represent the (environmentally) worst-case scenario.

16.3.3 Study Area

The study area will be based on the area of the works for the proposed development, within the blue line boundary, as this constitutes the area within which construction materials would be consumed (used, reused and recycled) and waste would be generated. This will be considered the first study area.

As recommended by IEMA guidelines, a second study area will focus on an area sufficient to identify the suitable waste infrastructure that could accept arisings or waste generated by the proposed development, and feasible sources and availability of construction materials typically required for construction works of this nature. Therefore, for the purposes of this assessment this second study area will focus primarily on the County of Clare, which is where the proposed development is located.

Waste infrastructure availability for recycling and recovery is set to be as close to the proposed development as possible, following the Proximity Principle, including permitted landfills. Waste infrastructure includes construction and demolition (C&D) waste, either through transfer, treatment, crushing and screening, or storage.

16.4 Receiving Environment

16.4.1 Built Assets and Utilities

The proposed development is located within the Moneypoint Generating Station, at the northern shore of the Lower Shannon Estuary, within the County Clare.

Moneypoint Generating Station comprises a large complex of structures for electricity generation, primarily for coal fired stations. Chapter 1 provides further information on the background and details of the current state of the Moneypoint Generating Station.

The proposed development aims to transition from a coal fired power station to a HFO and will include all the construction of the associated required infrastructure, which is detailed in Chapter 1 and Chapter 4.

16.4.2 Regional Material Assets

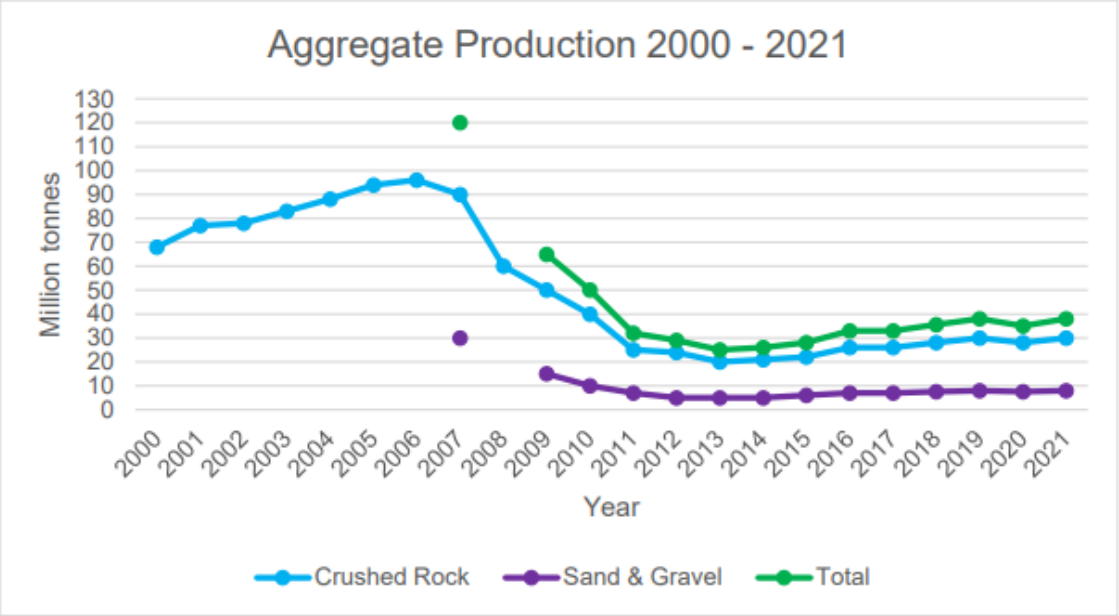
Aggregate materials (such as sand, gravel, sandstone and crushed rock) are the main raw material assets used to make construction products. Three main sources to obtain these aggregates are:

- Land-won (often referred to as natural or primary aggregates) – these are extracted directly from the ground in quarries or pits.
- Marine-dredged – these comprise of sand and gravel dredged from the sea floor.
- Secondary/recycled – secondary aggregates are a by-product from mineral operations or industrial processes, and recycled aggregates are materials produced by treatment of construction and demolition waste.

Information on the demand for key construction materials within Ireland has been used to provide the baseline for material assets. The aggregates demand in Ireland is considered to be double of the average demand in other European countries[162]. Ireland aggregate production has been steady over recent years, with an estimated production of 38 million tonnes in 2021; of which approximate nine million tonnes were sand and gravel and 29 million tonnes were crushed rocks (Figure 16.1).

[162] SWECO (2023) Analysis of aggregates market in Ireland [online]. Available at: https://www.epa.ie/media/epa-2020/licensing-amp-permitting/waste/SWECO-2023-Analysis-of-Aggregates-Market-in-Ireland.pdf. Last accessed September 2023.

Figure 16.1: Estimated Aggregate Production in Ireland



Source: SWECO

An outline of Ireland's requirements for materials, minerals or mineral related products, based on annual production or sales is provided in Table 16.9.

Table 16.9: Ireland demand of materials and minerals/mineral products (million tonnes, unless otherwise stated)

Mineral	Ireland demand	Year of data	Additional comment
Primary/raw aggregate, of which:	38	2021	Referred to Ireland's production
● Crushed rock	29	2021	Referred to Ireland's production
● Sand and gravel	9	2021	Referred to Ireland's production
Cementitious products, of which:			
● Cement finished	1.8	2021	Referred to Ireland's sales
● Ready mixed concrete	4.9 million cubic meters	2018	Referred to Ireland's production
Apparent steel use, finished steel products	0.89	2022	Referred to Ireland's sales

Source: SWECO (2023)[162], Irish Concrete Federation (2019)[163], British Geological Survey (2023)[164], Knoema (2023)[165]

It is estimated that there are approximately 500 quarries extracting aggregates throughout Ireland[163]. Additionally, Ireland has at least four facilities for the production of recycled

[163] Irish Concrete Federation (2019) Essential aggregates – Providing for Ireland's needs to 2040 [online]. Available at: https://irishconcrete.ie/wp-content/uploads/2019/10/Essential-Aggregates-Final.pdf. Last accessed September 2023.

[164] British Geological Survey (2023) World mineral statistics 2017-2021 [online]. Available at: https://www2.bgs.ac.uk/mineralsuk/statistics/worldStatistics.html. Last accessed September 2023.

[165] Knoema (2023) Steel statistical yearbook [online]. Available at: https://knoema.com/SSY2018Dec/steel-statistical-yearbook. Last accessed September 2023.

aggregates. Recycled aggregates are derived from reprocessing materials previously used in construction. Examples include recycled concrete from C&D waste, power station ash. Secondary Aggregates are usually by-products of other industrial processes not previously used in construction.

Reserves of aggregates materials within Ireland are considered to be high and abundant[163], although there is no publicly available information on the reserves for each aggregate material. No active mineral sites are in proximity to the proposed development, and the closest quarry is Derrynalecka Quarry (crushed rock) which is located approximately 11km from the proposed development[166].

16.4.3 Regional Waste Management

EPA records the composition of C&D waste arising in Ireland. The EPA waste data release[167] published in August 2023 shows that the quantity of C&D waste generated and collected in Ireland increased to nine million tonnes in 2021. The C&D waste comprised the following proportions:

- Soil, stones and dredging spoil – 85.1%
- Concrete, brick, tile and gypsum – 6.7%
- Mixed C&D waste – 4.0%
- Metal – 2.8%
- Bituminous mixtures – 1.0%
- Segregated wood, glass and plastic – 0.4%

The EPA notes that most of the C&D waste finally treated in Ireland was reused as backfill (85%) in 2020, while 7% went for disposal and only 8% of all C&D waste was recycled. The dominance of backfilling as a treatment operation reflects the large proportion of soil and stones in C&D waste.

The WFD requires each Member State of the European Union to achieve 70% material recovery of non-hazardous C&D waste (excluding soil and stones) by 2020. This target is confirmed to be applicable to Ireland through the Waste Action Plan for a Circular Economy. The EPA determined that Ireland achieved 85% material recovery of such waste in 2021 surpassing the 70% target[167].

C&D waste is recovered at EPA licensed landfills and Local Authority permitted sites. The Southern Region Waste Management Plan 2015-2021 indicates that the number of operational landfills across Ireland has been decreasing, and therefore alternative recovery options are required, particularly for C&D waste. It also states that consideration must be taken to recover inert waste as infill material, when appropriate, as part of land uses strategies.

Information on the permitted capacity of waste management facilities has been used in the assessment, based on current publicly available information at the time of submission. However, it should be noted that the capacity information obtained from the EPA for the sites and regions identified does not necessarily mean that the capacity detailed would be available for use by the proposed development.

[166] Geological Survey Ireland (2023) Quarry Directory 2014 [online]. Available at: https://www.gsi.ie/en-ie/data-and-maps/Pages/Minerals.aspx#MPM. Last accessed September 2023.

[167] Environmental Protection Agency (2023) Construction & Demolition Waste Statistics for Ireland [online]. Available at: https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/ Last accessed September 2023

There is a limited number of operational waste facilities present in County Clare, in which the proposed development is located, and currently there are four EPA licensed waste facilities (excluding landfill sites) in County Clare. These are listed in Table 16.10.

Table 16.10: EPA Waste Management Licensed Facilities

Active Licence No.	Facility Type	Name of the Facility	County	Location
W0041-01*	Hazardous waste facility	Enva Ireland Limited	Clare	Enva Ireland Limited (Shannon), Smithstown Industrial Estate, Shannon, Clare.
W0253-01*	Materials recovery facility	Clean (Irl) Refuse & Recycling Co	Clare	Clean (Irl) Refuse & Recycling Co., Ballinagun West, Cree, County Clare, Clare.
W0150-01	Waste transfer station	Clare County Council	Clare	Scarriff Civic Amenity Centre, Fossa Beg, Feakle Road, Scarriff, Clare.
W0170-01	Waste transfer station	Clare County Council	Clare	Lisdeen Recycling Centre & Transfer Station, Cemetery Road, Lisdeen, Kilkee, Clare.

*Waste Licence now deemed Industrial Emissions Licence

Source: EPA Licence portal (2023)[168]

Currently there are three operational landfill sites in Ireland which accept C&D wastes, one of which is an EPA licensed landfill site currently operational in County Clare. They are listed in Table 16.11 below.

Table 16.11: EPA Licensed Landfills

Active Licence No.	Facility Type	Name of the Facility	Location	Capacity of C&D waste for disposal/recovery (Maximum tonnes per annum)	Additional notes
W0146-01	Landfill	Knockharley Landfill Limited	Knockharley Landfill, Knockharley, Navan, (Includes Townlands of Tuiterath & Flemingstown), Meath.	285,000[168]	Capacity for 25,000 tonnes per annum of C&D waste for recovery[169]
W0165-02	Landfill	Ballynagran Residual Landfill Co. Wicklow	Ballymurtagh Landfill Facility, Ballymurtagh, Ballygahan Upper, Ballygahan Lower, Tinnahinch, Wicklow.	112,500[170]**	Capacity of 28,000 tonnes per annum of C&D waste for recovery[169]
W0109-02*	Landfill	Drehid Waste	Inagh Landfill, Ballyduff Beg, Inagh, Clare.	2,000[171]	No C&D waste disposal and limited waste for the purpose of daily cover, site

[168] Environmental Protection Agency (2023) Industrial Emission Licence – Knockharley Landfill Limited [online]. Available at: https://epawebapp.epa.ie/terminalfour/waste/waste-view.jsp?regno=W0146-01. Accessed January 2024.

[169] Environmental Protection Agency (2022) Waste infrastructure in Ireland [online]. Available at: https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/infrastructure/. Accessed September 2023.

[170] Environmental Protection Agency (2013) Industrial Emission Licence – Ballynagran Residual Landfill [online]. Available at: https://epawebapp.epa.ie/terminalfour/ippc/ippc-view.jsp?regno=W0165-02. Accessed January 2024.

[171] Environmental Protection Agency (2013) Industrial Emission Licence – Drehid Waste Management Facility [online]. Available at: https://epawebapp.epa.ie/terminalfour/ippc/ippc-view.jsp?regno=W0109-02. Accessed January 2024.

Active Licence No.	Facility Type	Name of the Facility	Location	Capacity of C&D waste for disposal/recovery (Maximum tonnes per annum)	Additional notes
		Management Facility Co. Kildare			construction and landfill restoration[171] [169]

Source: EPA 2023[168], 2022[170] and 2013[171, 171]

Note: *Waste Licence now deemed Industrial Emissions Licence

**Figure does not include household waste capacity

It is noted that any future changes to this permitted capacity are uncertain, as there is potential for change to permitted capacities, opening of additional waste management facilities and closure of existing facilities. However, it is not currently possible to predict the timeframes for when these waste management facilities will be available/unavailable and, therefore, how many of these sites would be available to accommodate waste arisings from the proposed development.

16.4.3.1 Construction and Demolition Waste

According to data of facilities operating under a waste facility permit, in 2018 soils arisings from C&D in Ireland were approximately 1.4Mt. Approximately 0.8Mt were received in soil recovery facilities in the Southern region[172].

The Southern region had the highest number of registered soil recovery facilities operating under certificate of registration. By the year 2018, the Southern region had a total of 83 facilities, of which 16 were located in the Clare. The national intake of waste in these facilities for Ireland was approximately 387,000 tonnes of which approximately 189,000 tonnes were received in facilities located in the Southern region[172].

As the construction sector continues to grow in the region, it is imperative that construction and demolition plans for developments in excess of the specified thresholds are put in place and enforced. The appropriate processing facilities need to be in place to facilitate increased reuse, recycling and recovery of this waste stream.

16.4.3.2 Hazardous Waste

The amount of hazardous waste generation in Ireland was relatively consistent from 2009 to 2014, at approximately 300,000 tonnes. However, since 2015 there has been a relatively rapid increase in the volume of hazardous waste generated, increasing to 581,000 tonnes in 2019.

Incinerator ash and contaminated soils have been significant contributing factors in this increase. However, incinerator bottom ash is no longer classified as hazardous since 2020 onwards. This, in addition to a decrease in contaminated soils arisings, resulted in a decrease of 16% of hazardous waste generation from 2020 to 2021, where approximately 466,941 tonnes of hazardous waste were generated across Ireland.

Ireland's hazardous waste is treated either on-site at the industrial facility where the waste was generated (under conditions of EPA licence), off-site at hazardous waste treatment facilities in

[172] Government of Ireland (2020) Construction and demolition waste – Soil and stone recovery/disposal capacity (Update Report 2020) Eastern Midlands region, Connacht Ulster region and Southern region [online]. Available at: https://www.southernwasteregion.ie/sites/default/files/National%20C%20%20D%20Report%20Dec%202020%20for%20Publication.pdf Accessed January 2024.

Ireland; however, most of the hazardous waste is exported for further treatment or disposal. Of the total hazardous waste generated in 2019, approximately 65% was exported, to countries such as the United Kingdom and Norway, for further treatment or disposal, whereas approximately 35% underwent treatment within Ireland.

16.5 Likely Significant Impacts

16.5.1 Materials and Waste Associated with the Proposed Development

Adverse environmental effects for material assets use and waste management have the potential to be generated through transportation of materials and waste to and from the proposed development, such as impacts on the air quality, carbon emissions, and noise. The effects of these activities are considered separately in the relevant technical chapters including Air Quality (Chapter 7), Climate (Chapter 8) and Noise and Vibration (Chapter 9).

Adverse environmental effects of land contamination, such as impacts on groundwater and human health, have not been considered for this assessment, as these have been considered in Chapter 12 Land, Soils and Hydrogeology. In the event that contaminated land is identified through the ground investigation or during construction, this chapter considers the management of this waste only.

16.5.1.1 Use of Material Assets

Material assets required for the construction phase of the proposed development include raw materials such as aggregate and minerals from primary, secondary and recycled sources, and manufactured construction products. Manufactured construction products include materials required for the construction of road surface, pre-cast elements for the construction of structures, signage, lighting and fencing.

It is anticipated that the proposed development will require large quantities of both primary raw materials and manufactured construction products. Many material assets may originate off-site, purchased as construction products. However, some materials may arise on site, for example excavated soils and sub-strata, C&D waste (such as stones) and ash (Table 16.12).

It is not anticipated that materials will be required for dismantling activities and, even if any were, the quantities of both primary raw materials and manufactured products required will be negligible compared to those required for the construction phase. Therefore, it is anticipated that there will not be any impacts to material asset use relating to the demolition activities (as part of site preparation works) and dismantling.

The materials likely to be required during the construction phase are as follows (although the list is not exhaustive):

- Steel
- Aggregate materials
- Cement
- Concrete
- Plastic

Quantitative information provided by ESB has been used to estimate the quantities of material assets required for the construction of the proposed development, which have been summarised in Table 16.12. Materials used to produce finished products (for example cables, communication systems, signage, CCTV, signalling infrastructure) have not been included in this assessment.

Table 16.12: Summary of estimated material assets requirements for the proposed development

Activity	Material assets required	Estimated quantity (m^3, unless otherwise specified)*	Base of product
Site clearance (including vegetation clearance)	No material assets are expected to be required for site clearance	NA	NA
Dismantling works	No materials assets are expected to be required for dismantling works	NA	NA
Construction works	Soil	203	Bulk material
	Subsoil: Roads and foundations	1,950	Bulk material
	Subsoil: services trenches	741	Bulk material
	Topsoil	421	Bulk material
	Stone	10,145	Bulk material
	Concrete	8,380	Aggregate based
	Rebar	107	Metals
	PVC pipework	89	Hard plastic
	Cladding	1,311 tonnes	Metals
	Structural steel	309 tonnes	Metals

Note: * Estimated quantities include a bulking/safety factor

Source: Resources and Waste Inventory (ESB, 2023)

The majority of the raw materials required for the proposed development would typically be defined as bulk materials. The recycled content of the material that could be used in the proposed development is unknown at this stage. Best practice would be to use materials with a high proportion of sustainable features and benefits compared to industry-standard materials, where it is technically appropriate and economically feasible to do so.

A summary of all the required bulk and aggregate based material assets for the proposed development is presented in Table 16.13.

Table 16.13: Summary of aggregate based materials assets to be used in the proposed development

Material	Estimated quantity (m^3)	Additional notes
Soils (including soil, subsoil and topsoil)	3,315	Bulk material, assumed to be classed as sand and gravel
Stones	10,145	Bulk material, assumed to be classed as crushed rock
Concrete	8,380	Aggregate based, assumed to be classed as sand and gravel
Total material	21,840	
Total of sand and gravel	11,695	
Total of crushed rock	10,145	

Source: Table 16.12

Table 16.14 provides indicative figures for the earthwork volumes that are expected to be required by the proposed development. It is expected that approximately 14,374m^3 of cut material will arise from the proposed development, and a total of 21,947m^3 of materials will be required for fill activities, which will be mainly imported to the site.

Table 16.14: Estimated cut and fill volume balance from construction activities at the proposed development

Material	Cut (m^3)	Fill (m^3)	Additional notes
Soil	6,144	203	Cut value likely to arise from excavation activities. 101m^3 of the fill material expected to be reused in the proposed development
Subsoil: Roads and foundations	-	1,950	
Subsoil: services trenches	741	741	Cut value likely to arise from excavation activities. 65m^3 of the fill material expected to be reused in the proposed development
Topsoil	421	421	Cut value likely to arise from excavation activities. 211m^3 of the fill material expected to be reused in the proposed development
Stone	6,565	10,145	Cut value likely to arise from demolition activities associated with site preparation works. 312m^3 of the fill material expected to be reused in the proposed development.
Concrete	473	8,380	Cut value likely to arise from demolition activities associated with site preparation works.
Rebar	30	107	Cut value likely to arise from demolition activities associated with site preparation works.
Approximate total	14,374	21,947	
Approximate total fill material from reused sources:		689	

Source: Resources and Waste Inventory (ESB, 2023)

It is anticipated that only a nominal amount of site-won material would be reused in the proposed development, due to the potential poor quality of the material and its unsuitability for use as structural fill. Therefore, it is likely that material required for the construction of the proposed development, including backfilling of structures, would be imported to the proposed development. A worst-case scenario implies fill material and other construction material will need importing to the proposed development and all excavated material will be landfilled.

16.5.1.2 Waste Management

When considering the generation and management of waste, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The EU WFD 2008/98/EC defines waste as *"any substance or object which the holder discards or intends or is required to discard"*.

Waste is likely to be generated mainly from the site preparation works, which may result in the following waste arisings (although the list is not exhaustive):

- Waste arising from the decommissioning works at the coal handling plant.
- Inert waste from demolition and site preparation works.
- Excavated materials (natural and made ground) which may be contaminated (and potentially classified as hazardous) or unsuitable for reuse without treatment.
- Unsorted non-hazardous materials, such as timber, tarmac, signage, removal of existing footpaths, etc.
- Surplus materials from the site preparations, excavations and construction.
- Damaged stocks or off-cuts.

- Debris and rubbish lying on the ground.

Waste is anticipated to arise at the proposed development considering that the proposed development will include the partial decommissioning and removal of coal handling plant and the dismantling of associated buildings with the removal of structures to ground level. Table 16.15 presents initial estimations for C&D waste expected to arise from excavation works, demolition works associated with site preparation works, and partial dismantling of coalyard.

Table 16.15: Anticipated waste arising from construction activities and partial dismantling of coalyard for the proposed development

Material	Initial waste arising estimations (m^3)	Exported for off-site treatment or disposal (m^3)	Reuse within the proposed development (m^3)	Additional notes
Soils* (soils, subsoils, topsoils)	7,306	6,929	377	Non-hazardous waste from excavation works
Stone	6,565	6,253	312	Inert waste from demolition works for construction of proposed development
Concrete**	581	581	-	Inert waste from demolition works for construction of proposed development and partial dismantling of coalyard
Rebar**	30	30	-	Non-hazardous waste from demolition works
Rubber	38	38	-	Non-hazardous waste from partial dismantling of coalyard
Oils	6 (tonnes)	6 (tonnes)	-	Hazardous waste from partial dismantling of coalyard
Approximate total	14,520	13,831	689	For inert and non-hazardous waste only
Approximate total inert waste	7,146	6,834	312	
Approximate total non-hazardous waste	7,374	6,997	377	
Approximate total from excavation works	7,306	6,929	377	
Approximate total from demolition/dismantling works	7,220	6,908	312	

Source: Resource and Waste Inventory (ESB, 2023), Demolition Estimate (RVA, 2023)

Notes: *Soils and subsoils potentially could be inert, but as a worst-case scenario these have been deemed as non-hazardous **Assumed all concrete and rebar arising from demolition/dismantling activities cannot be reused and will be exported for disposal as a worst-case scenario

Based on the quantities of materials assets provided by ESB, waste arisings from construction activities have not been quantified yet. However, based on professional judgement, a worst-case scenario would assume that 10% of materials assets required for the proposed development and brought to the site will become waste due to damages, off-cuts or surplus. Table 16.16 summarises the anticipated waste arisings from the construction works based on the required material assets (Table 16.12).

Table 16.16: Estimated waste arising from the construction works at the proposed development as a worst-case scenario

Material	Quantity of potential losses (m^3, unless otherwise specified)	Type of waste
Soil	20	Non-hazardous
Subsoil: Roads and foundations	195	Non-hazardous
Subsoil: services trenches	74	Non-hazardous
Topsoil	42	Non-hazardous
Stone	1,015	Inert
Concrete	838	Inert
Rebar	11	Non-hazardous
PVC pipework	9	Non-hazardous
Cladding	131 tonnes	Non-hazardous
Structural steel	31 tonnes	Non-hazardous
Approximate total	2,204m^3 of mixed waste plus 162 tonnes of non-hazardous waste	
Approximate inert waste	1,853m^3	
Approximate non-hazardous waste	351m^3 plus 160 tonnes of steel	

Source: Table 16.12

16.5.2 Do Nothing

The do nothing scenario, where the proposed development does not proceed, is described in Section 3.2. In terms of materials assets use and waste generation and management, the do nothing scenario is not expected to have an impact on the use of material assets and waste generation. The main increase of material assets and waste generation in this scenario will come from the increased needs for maintenance of the current Moneypoint Generating Station. Therefore, for material assets and waste management, and according to Table 3.4 of EPA Guidelines 2022, the predicted significance of effect is expected to be considered as Not Significant.

16.5.3 Construction Phase

16.5.3.1 Material Assets

The majority of raw materials, required for the proposed development, are aggregate-based materials and steel (Table 16.12). Aggregates materials are considered to be abundant and with high reserves across Ireland (Section 16.4.2). There is no regional information on the landbanks for sand and gravel reserves. The assessment of Greenhouse Gases emissions is considered separately in the respective technical Chapter 8 Climate.

It is expected that the proposed development will require to import approximately 21,840m^3 of bulk and concrete materials assets. It is assumed that these materials will mainly comprise sand and gravel and crushed rock, as stated in Section 16.3.4. Therefore, it is anticipated that the proposed development would require approximately 11,695m^3 of sand and gravel materials and 10,145m^3 of crushed rock materials. Assuming a density of 1.9 tonnes/m^3 for sand and gravel[173] and 1.6 tonnes/m^3 for crushed rock[173]; then these values are equivalent to approximately 22,220 tonnes of sand and gravel and 16,232 tonnes of crushed rock.

[173] RFCafe (2021) Density of some common building materials [online]. Available at: https://www.rfcafe.com/references/general/density-building-materials.htm. Accessed December 2023.

Based on the demand for sand and gravel and crushed rock in Ireland (Figure 16.1 and Table 16.9) in 2021, the proposed development will require approximately 0.25% of the sand and gravel production, and approximately 0.06% of the crushed rock production in Ireland.

The values for sand and gravel mentioned above include the required imported fills to the proposed development. However, it is anticipated that at least 377m^3 of excavated materials will be reused within the proposed development (Table 16.14). Therefore, the required sand and gravel fill will be slightly reduced.

It is anticipated that there would be a direct and permanent effect on the availability of material assets and in the depletion of non-renewable resources, due to the use of material assets during the construction phase. Prior to any mitigation measures, based on IEMA's guidelines, the sensitivity of effect is considered as Low (Table 16.2), and the magnitude of effect is Negligible (Table 16.3). Therefore, the equivalent sensitivity and magnitude of effect based on the EPA Guidelines 2022 is Low for sensitivity and Negligible for magnitude of effect (Table 16.6 and Table 16.7). According to IEMA, the effect threshold for the proposed development would be considered as Slight, while the environmental effect would be Not Significant (Table 16.4 and Table 16.5). The predicted significance of effect, following EPA Guidelines 2022 is expected to be classed as Not Significant for material assets (Table 16.8).

16.5.3.2 Waste Management

It is assumed that all vegetation waste arising from general site clearance, if any arise, will be managed according to the Resource and Waste Management Plan (RWMP). Therefore, it is assumed that vegetation waste will be chipped on site or composted in a waste management facility and diverted from landfill disposal.

Waste arising from packaging material and the site office has not been quantified. It is assumed that the majority of these wastes will be recycled and not landfilled. Packaging and office waste arisings will be managed in accordance with the RWMP.

It is assumed that all construction materials used for temporary construction works (such as for construction access roads and site office) will be managed in accordance with the RWMP. It is also assumed that these materials will be reused and recycled after the construction of the proposed development and will not generate waste.

It is anticipated that approximately 7,306m^3 of soils from excavation activities will arise from the proposed development, of which approximately 6,929m^3 is expected to be exported to off-site treatment and/or disposal and 377m^3 is anticipated to be reused (Table 16.15). Additionally, initial estimations of waste arising from demolition (as part of site preparation works) and dismantling activities indicate that approximately 7,220m^3 of waste would arise from the proposed development, of which 312m^3 of stone is anticipated to be reused within the proposed development (Table 16.15).

A worst-case scenario for construction waste arisings is considered, where it is assumed that 10% of material assets required for the proposed development and brought to the site would become waste due to damages, off-cuts or surplus. Therefore, it is anticipated that approximately 2,204m^3 of waste will arise from the proposed development during the construction stage, of which 1,853m^3 is anticipated to be inert waste and 351m^3 to be mixed non-hazardous waste (Table 16.16).

The fate of the waste arising from the proposed development is not defined yet. Additionally, to determine the most appropriate management of waste, the waste must be appropriately classified under the European Waste Codes (EWC). This, in turn, must be compliant with the acceptance criteria and permitted within the waste management facility.

Table 16.10 outlines waste management facilities within the County Clare that may be able to receive waste arisings from the proposed development. Not all treatment facilities may be suitable for the proposed development to use, but it aims to demonstrate that there are treatment facilities that may be suitable to use by the proposed development. Table 16.11 outlines landfills permitted to receive C&D waste.

Appropriate waste management facilities will be identified upon commencement of construction by the principal contractor. The close proximity principle will be taken into consideration, when technically feasible and economically viable.

Although the fate of waste arisings is not yet defined, C&D waste arisings will be segregated appropriately. It is, therefore, envisaged that majority of C&D waste arisings from the proposed development will be taken for recovery/recycling to a licensed waste management facility. Therefore, disposal of waste to landfill would be minimised and considered as the last option.

A summary of the waste arisings from the proposed development, with the equivalent value in tonnes, is provided in Table 16.17. An approximate of 33,147 tonnes of mixed inert and non-hazardous waste is anticipated to arise from the proposed development. Hazardous waste is not anticipated to arise from the site preparation and construction works as stated in project description. However, it is estimated that approximately six tonnes of oils will arise from the partial dismantling of coalyard, which are anticipated to be classed as hazardous waste. Oil arisings will be collected by an appropriately licensed waste collection contractor and sent to an appropriate hazardous waste management facility for treatment and recycling in accordance with the Waste Management Regulations. Oil arisings will be managed as higher up in the waste hierarchy as technically and economically feasible and, therefore, are anticipated to be diverted from landfill disposal.

Table 16.17: Summary of estimated waste arisings from the proposed development

Source of waste	Type of waste	Quantity (m^3, unless otherwise specified)	Assumed density (tonnes/m^3)	Quantity (tonnes)
Excavation	Soil, subsoil, topsoil (non-hazardous)	6,929	1.5[174]	10,394
Demolition (as part of proposed construction works), and partial dismantling of coalyard	Stone, concrete (inert)	6,834	2.5[175]	17,085
	Rebar (non-hazardous)	30	7.85[176]	237
	Rubber (non-hazardous)	38	1.2	46
	Oils (hazardous)	6 tonnes	-	6
Construction*	Soil, subsoil, topsoil (non-hazardous)	322	1.5[174]	497
	Stone, concrete (inert)	1,853	2.5[175]	4,631
	Rebar (non-hazardous)	11	7.85[176]	84

[174] Grain SA (n.d) Soil: The producer's most important asset: Physical properties of soil [online]. Available at: https://www.grainsa.co.za/soil-the-producers-most-important-asset--part-5-physical-properties-of-soil?print=1. Accessed December 2023.

[175] Housing (2023) Concrete density: Importance, measurement and common ranges [online]. Available at: https://housing.com/news/density-of-concrete/. Accessed December 2023.

[176] Construction News (2018) Some useful steps to estimate per meter weight of reinforced steel bar [online]. Available at: https://www.constructionnews.co.in/estimate-per-meter-weight-of-reinforcing-steel-bar.html. Accessed December 2023.

Source of waste	Type of waste	Quantity (m^3, unless otherwise specified)	Assumed density (tonnes/m^3)	Quantity (tonnes)
	PVC pipes (non-hazardous)	9	1.33[177]	12
	Cladding and structure steel (non-hazardous)	162 tonnes	-	160
Approximate total mixed waste arisings in tonnes (inert and non-hazardous)				33,147
Approximate total inert waste arising in tonnes				21,716
Approximate total non-hazardous waste arising in tonnes				11,431
Approximate total hazardous waste arising in tonnes				6

Source: Table 16.14, Table 16.15, Table 16.16 Note: *Waste arisings from construction activities assume a worst-case scenario of 10% of material assets becoming waste due to surplus, damages or off cuts

Waste arisings from the proposed development will be dealt in accordance with a RWMP, which has been drafted and included the waste hierarchy and circular economy principles. A Construction Environmental Management Plan (CEMP) has also been drafted which should be implemented by the principal contractor prior the commencement of works to ensure appropriate management of the waste arisings.

All waste generated during the construction phase will be managed in accordance with the relevant provisions of the Waste Management Act 1996 and associated amendments and regulations, particularly with regard to the use of appropriately permitted waste contractors and appropriately authorised destinations for waste materials. All waste management measures will adhere to the conditions of the Industrial Emissions (IE) licence, the Waste Management Act 1996 and associated regulations. Additionally, in consideration of the WFD and the Waste Action Plan for Circular Economy, the proposed development will comply with at least 70% of non-hazardous C&D to be diverted from landfill disposal.

The maximum combined capacity for waste disposal in landfills is of approximately 399,500 tonnes per year (Table 16.11). Considering a worst-case scenario where 30% of the waste arising being disposed of to landfills, then approximately 9,944 tonnes will be disposed of to landfill (Table 16.17). Therefore, a worst-case scenario estimates that the proposed development will occupy approximately 2.5% of the total annual landfill capacity.

Therefore, prior to any mitigation measures, it is anticipated that the proposed development would have a direct and permanent effect. Based on the IEMA's guidelines, the sensitivity of effect would be Medium, and the magnitude of effect would be Minor (Table 16.2 and Table 16.3). The equivalent sensitivity and magnitude of effect to the EPA Guidelines 2022 are expected to be Medium and Low, respectively. According to IEMA, the effect threshold would be Slight, and the environmental effect would be Not Significant (Table 16.4 and Table 16.5). The predicted significance of effect, in accordance with the EPA Guidelines 2022, would be Slight (Table 16.8).

Nonetheless, the proposed development will aim to implement the waste hierarchy and circular economy principles and, therefore, the impacts are expected to be minimised.

[177] Plastic Ranger (2023) Density of PVC material [online]. Available at: https://plasticranger.com/density-of-pvc/. Accessed December 2023.

16.5.4 Operation and Maintenance Phase

Details on the operational phase for the proposed development are given in Chapter 4. Associated volumes or quantities of material assets required during the operational and maintenance phase are unlikely to be large. The main materials that may be required during the operational and maintenance phase will be diesel, propane and cement.

The cement will be used in the FGD/ash capping layer, which it is anticipated will comprise 47.5% fly ash, 47.5% FGD by-product and 5% cement. This equates to approximately 26,000m^3 cement in the case of the ASA. In this regard, cement is not expected to be required in large quantities.

The development is proposed to be fuelled using HFO from 2025, and diesel and propane are anticipated to be used for start-up and shutdown of the plant. The proposed development envisages the installation of two new auxiliary boilers, of which one is expected to be electric, and one diesel fired boiler, as described in Chapter 4. It is proposed that the electric boiler will be the primary auxiliar boiler, with the diesel boiler being started when required (see Section 4.2.3 for further details). Hence, a reduction on the requirements of diesel is likely to occur by the end of 2025.

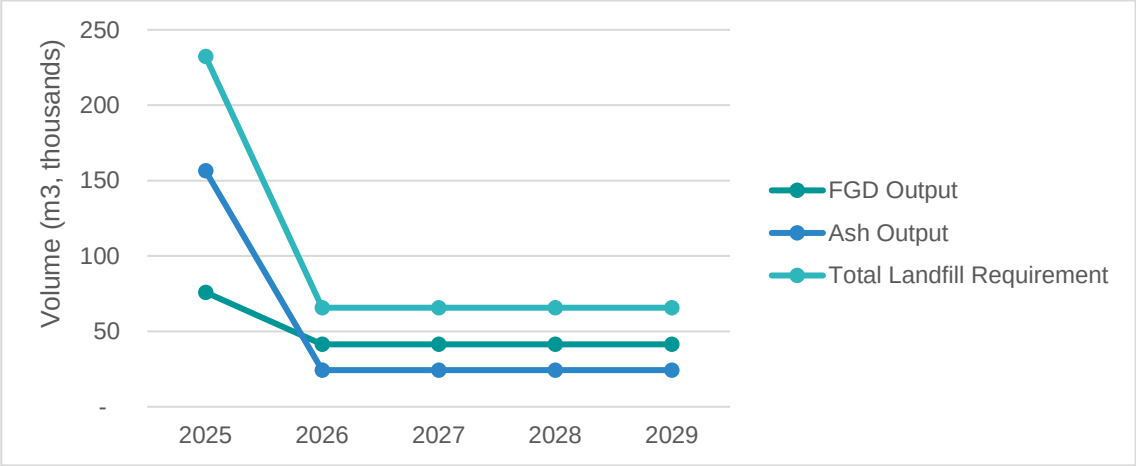
Further materials assets required in the operational phase of the proposed development, such as chemicals, oils and gases, are outlined in Section 4.4.10. Due to the changes proposed for the operational phase (refer to Chapter 4 for further details) an increase on the use of these materials assets is not anticipated. On the contrary, a reduction on the requirements of these materials is envisaged, in comparison with the current baseload operation requirements by the end of 2025.

Therefore, materials assets associated with the operational and maintenance phase will result in neutral, temporary and imperceptible effects. Expected sensitivity and magnitude of effect are expected to be Low and No change, respectively (Table 16.2 and Table 16.3). The predicted significance of effect, in accordance with the EPA Guidelines 2022, would be Not Significant (Figure 16.1 and Table 16.8).

It is also unlikely that waste will be generated in large quantities from the operational and maintenance phase. Main waste materials that will be generated during the operational phase are ash and FGD by-product. Waste generated throughout the operation of the proposed development will be dealt in accordance with the waste hierarchy and circular economy principles. Additionally, waste generated during this phase will be managed in line with requirements of the IE Licence, the Waste Management Act 1996 and associated regulations.

Ash content generated will be significantly reduced as a result of HFO combustion, from 7.7%-9.1% from coal to 0.15% from HFO. This will reduce the requirements of ash to be stored. Figure 16.2 details the estimated FGD and ash outputs from 2025 to 2029, where it can be observed that a significant decrease in the outputs is anticipated as a result of HFO combustion. Consequently, the landfill requirements are estimated to be reduced from approximately 232,330m^3 in 2025 to approximately 66,000m^3 in 2029.

Figure 16.2: Estimated FGD and ash outputs, ash recovery volume and required landfill void capacity from 2025 to 2029 for the proposed development



Source: ESB, 2023

It is proposed to reuse the ash to increase the FGD/ash capping layer in the FGD Landfill Area A. It is also proposed to store the FGD by-product in the ASA once the FGD Landfill Area A is out of further capacity. Therefore, it is not anticipated for the proposed development to have an impact in external landfill capacity across Ireland.

Therefore, waste associated with operation and maintenance activities will result in temporary imperceptible effects for waste managed up in the waste hierarchy. Waste disposed of in landfill will result in neutral, permanent and imperceptible effects. Expected sensitivity and magnitude of effect are expected to be Negligible and No change, respectively (Table 16.2 and Table 16.3). The predicted significance of effect, in accordance with the EPA Guidelines 2022, would be Not Significant (Table 16.8).

16.5.5 Decommissioning Phase

Moneypoint Generating Station is expected to cease operations after the year 2029 and should this station be decommissioned; waste will be generated. The decommissioning of this station will be subject of a separate planning permission. A Decommissioning Management Plan (DMP) will be prepared in accordance with the IE licence application and reviewed annually.

Waste arising from the decommission of the proposed development have not been quantified at this stage. However, initial estimations by RVA (2023) have allowed for a high-level assessment for the decommissioning phase. Approximate 1,918 tonnes of mixed inert and non-hazardous C&D waste are estimated to arise from the decommissioning phase. Assuming a worst-case scenario where 30% of the waste arising being disposed of to landfill, then approximately 576 tonnes will be disposed of to landfill. In addition, assuming a similar maximum combined landfill capacity in 2029 as per Table 16.11, then the decommissioning phase is estimated to occupy 0.1% of the annual landfill capacity.

Therefore, prior to any mitigation measures, it is anticipated that the decommissioning phase of the proposed development would have a direct and permanent effect. Based on the IEMA's guidelines, the sensitivity of effect would be Low, and the magnitude of effect would be Negligible (Table 16.2 and Table 16.3). The equivalent sensitivity and magnitude of effect to the EPA Guidelines 2022 are expected to be Low and Negligible, respectively. According to IEMA, the effect threshold would be Slight, and the environment effect would be Not Significant (Table 16.4 and Table 16.5). The predicted significance of effect, in accordance with the EPA Guidelines 2022 would be Not Significant (Table 16.8).

16.6 Cumulative Effects

As detailed in section 16.5.3.1, it is anticipated for the construction phase to utilise 0.25% of the sand and gravel production in Ireland (as per year 2021, latest available data), and 0.06% of the crushed rock production. It is also anticipated a reduction on the requirements for material assets during the operational phase of the proposed development (see section 16.5.4). Therefore, no significant impact is anticipated for material assets for the proposed development.

Initial estimations of waste generation for the construction phase, including site preparation works, are detailed in section 16.5.3.2. Under worst-case scenarios, and prior any mitigation measure being implemented, it is estimated that waste arisings from the construction phase of the proposed development will occupy approximately 2.5% of the total annual landfill capacity for C&D waste.

During the operational phase is envisaged a reduction of the waste arisings from the proposed development. In addition, waste generated during this phase is not anticipated to have an impact on Ireland's landfill capacity, as it is proposed to manage waste generated within the proposed development.

However, during the construction phase of the proposed development, including site preparation works, other developments have the potential to result in cumulative effects with the proposed development for material assets and waste management. Further details of these developments are given in Chapter 5 of this EIAR.

The construction of these projects could potentially be concurrent with the construction phase of the proposed development. Therefore, there may be possible to cause cumulative impacts on material assets and waste generation. It could be assumed that some of these projects will have been constructed prior to the start of construction phase of the proposed development. However, due to the unknown proposed dates of construction for these projects to commence, they remain a consideration in this assessment.

The sensitive receptors which could potentially experience cumulative effects as a result of the use of material assets include quarries and other sources of minerals, and other finite raw material resources. The potential cumulative impacts these receptors may experience include:

- Depletion of non-renewable sources, such as sand and gravel and crushed rock
- Impact on the demand for materials assets across Ireland

The sensitive receptors which could potentially experience cumulative effects as a result of waste management are landfills and other waste management infrastructure. The potential cumulative impacts these receptors may experience include:

- Occupation of the annual landfill capacity for C&D waste in Ireland
- Occupation of available waste management infrastructure capacity

It is anticipated that these developments would all generate waste and require material assets during construction phase. As such, waste would require treatment and/or disposal at waste management facilities. There would also be a significant requirement for material assets, particularly during the construction of each of the projects unrelated to the proposed development.

The material assets anticipated to be required for these developments are not known at this time; nor the estimated waste likely to be generated from these developments. Therefore, it has not been possible to assess the cumulative effects due to the lack of material assets and waste arisings information.

Mitigation measures will be implemented as part of the construction of the proposed development (as detailed in section 16.7.1). The other developments will also be subject of compliance with

national regulations and policies. Therefore, it is anticipated that the other developments will also require mitigation measures to be adopted during their construction phases to reduce impacts to the environment; which will minimise any potential cumulative impact for material assets and waste management.

16.7 Mitigation and Monitoring Measures

Measures would be implemented to reduce the effects of material assets' use and waste generation and management during the construction and operational phase. There is substantial overlap in the mitigation for both aspects (material assets' use and waste generation), due to the synergy between the reuse of materials and the avoidance of waste generation.

An RWMP has been prepared prior to commencement of the construction works. The appointed contractor will implement the RWMP. The main aim of the RWMP is to ensure that waste is managed in accordance with the waste hierarchy and other relevant regulatory requirements. A Construction Environmental Management Plan (CEMP) has also been prepared and will ensure mitigation measures will be incorporated and implemented. The RWMP has been included within Appendix C.1.

16.7.1 Mitigation Measures

16.7.1.1 Construction Phase

Mitigation measures during the construction phase that promote an efficient use of material assets include the following (but are not limited to):

- Where feasible, materials would be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation.
- All suitable excavated material would be reused in the construction of the proposed development, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site. It is envisaged studies to be carried out to determine the suitability of materials to be reused within the proposed development. Stones from the HFO bund are likely to be not contaminated and, therefore, are anticipated to be reused within the proposed development. The envisaged studies include:
  - A Generic Quantitative Risk Assessment that will assess the risk to onsite and offsite environmental and human health receptors
  - A soil/material waste classification report looking at the material around the HFO tanks and elsewhere within the red line boundary that is to be removed and classifying this material
  - A material reuse plan to look at the fill material around the HFO tanks and adjudge its suitability to be used as fill material during the construction works
- Where site-won material is not available or suitable for reuse, secondary or recycled materials would be procured, where available and feasible.
- Temporary stockpiling of fill materials prior to incorporation in the proposed development would be avoided where possible, to ensure double handling and damage is minimised and therefore avoidance of waste. However, where required, materials would be stockpiled in accordance with best practice and managed appropriate to limit the likelihood of damage or contamination.
- Pre-cast elements would be used, where technically feasible, to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.

The waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Mitigation measures for reuse and recycling of waste include (but are not limited to):

- Reusing excavated soils on site, where possible.
- Recycling of inert materials by crushing, blending and subsequent reuse, as an aggregate.
- Providing on site facilities to separate out waste to enable the recovery of material through recycling.
- Where waste must be taken to a recycling or disposal site, the contractor would ensure that the site has the appropriate permits. In addition, the suitable facility would be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The contractor would identify the closest and relevant treatment and disposal sites.
- Waste arisings sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery/disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment.
- All contaminated/hazardous waste (including soil) would be identified for proper management and transferred/disposed of to an adequate waste management facility. These materials will be stored separately to any non-hazardous material to avoid cross-contamination.

A non-exhaustive list of waste management facilities sites is provided in Table 16.10. The ability for waste arisings to be deposited at these sites would be dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the proposed development that may be used.

Best practice would be to minimise the generation of waste as much as possible in accordance with the waste hierarchy principles and to incorporate circular economy principles, wherever it is technically appropriate and economically feasible. The use of the CEMP and RWMP would seek to implement these waste hierarchy and circular economy principles. Therefore, wherever technically appropriate and economically feasible, adequate mitigation measures will be applied to the proposed development and, therefore, the potential effects would be minimised.

The CEMP and RWMP will be available for inspection at all reasonable times for examination by the Local Authority.

16.7.1.2 Operational Phase

- Waste arising during operational phase on site will be managed as per the conditions of the IE licence (P0605-04).
- The waste hierarchy and circular economy principles would also be implemented throughout the operational phase of the proposed development. Mitigation measures for material assets and waste management include (but are not limited to):
- Delivering material assets to a just-in-time basis to avoid storage and double handling that could lead to damage or contamination and, therefore, to minimise waste arisings.
- Providing on site facilities to separate out waste streams to enable managing waste as high up in the waste hierarchy as feasible, prioritising the recovery and recycling of material over landfill disposal. In addition, provide clear signage and/or colour coded receptables in designated and easily accessible locations.
- Handling, storing, managing, reusing or recycling waste arisings as close as practicable to the point of origin.

- Managing and programming all operations programmes in such a manner as to prevent/minimise waste production. Circular economy principles to be incorporated where feasible.
- Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible.
- Ensuring all employees are aware of the best practices to optimise material assets use and minimise waste generation, including waste policies and procedures from ESB.
- Ensuring clear and effective communications and signage about recycling, waste hierarchy and circular economy.
- Establishing standard operations procedures that are aimed to minimising waste generation.
- Producing an Operational Waste Management Strategy (OWMS) is recommended. A OWMS will help to estimate waste arisings, provide an adequate management strategy, outline opportunities to reduce waste arisings and details on a waste monitor process.
- To manage the ash generated higher up in the waste hierarchy, permission will be sought from the EPA to reclaim ash from the ASA to use for capping material. This process will be regulated by the IEL. Sections 3.5 and 4.2.5 provide further details on the recovering of ash from the ASA.

16.7.2 Monitoring Measures

During the construction phase, materials and waste arisings will be monitored as outlined in the RWMP. Undertaking monitoring audits on a regular basis will give an indication of where continual improvements to waste management and minimisation can be made throughout the construction phase. The RWMP will be used to measure and monitor the types and quantities of waste taken off-site, to ensure that the waste hierarchy is being implemented, where practicable. Environmental management and compliance will also be monitored through the CEMP.

Once the proposed development is on the operational phase, the waste management will be supervised by suitable trained staff with knowledge in the waste control procedures, record keeping, maintenance requirements, emergency actions plans, and overall, on operational controls and environmental monitoring. Waste monitoring audits will also be undertaken during the operational phase on a regular basis, which will be recorded.

16.8 Residual Impacts

The proposed development will aim to implement the waste hierarchy and circular economy principles throughout the construction, operational and decommissioning phases. It is also anticipated that the proposed development will implement mitigation measures outlined in Section 16.7.1.

Additionally, during the construction phase waste will be managed in accordance with RWMP in order to meet the requirements of the national waste legislation and ensure waste will be managed higher up the waste hierarchy as technically appropriate and economically feasible.

Based on EPA Guidelines 2022, the residual effects for materials assets use for sensitivity and magnitude remains unchanged as Low and Negligible and therefore the environmental effects are Not significant.

The residual effects for waste generation may improve as waste will be managed higher up in the waste hierarchy and circular economy principles are expected to be implemented in the construction phase. However, a worst-case scenario indicated that the sensitivity and

magnitude remain unchanged as Medium and Low and, therefore, the environmental effects is Not significant.

It is not anticipated that the operational phase will require large quantities of material assets. Waste generated during the operational phase will be disposed of within the proposed development and, therefore, no impact to the national landfill capacity void is expected.

Therefore, residual effects from the construction phase are anticipated to be Not Significant, meanwhile residual effects from the operational phase are anticipated to be Imperceptible.

17 Major Accidents and/or Disasters

17.1 Introduction

This chapter considers the potential for significant adverse effects of the proposed development on the environment deriving from vulnerability of the proposed development to risks of relevant major accidents and/or disasters.

17.2 Policy and Guidance

17.2.1 Legislation

EIA Directive 2014/52/EU requires: "*A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters…*

In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council and Council Directive 2009/71/Euratom, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met".

17.2.2 Guidance

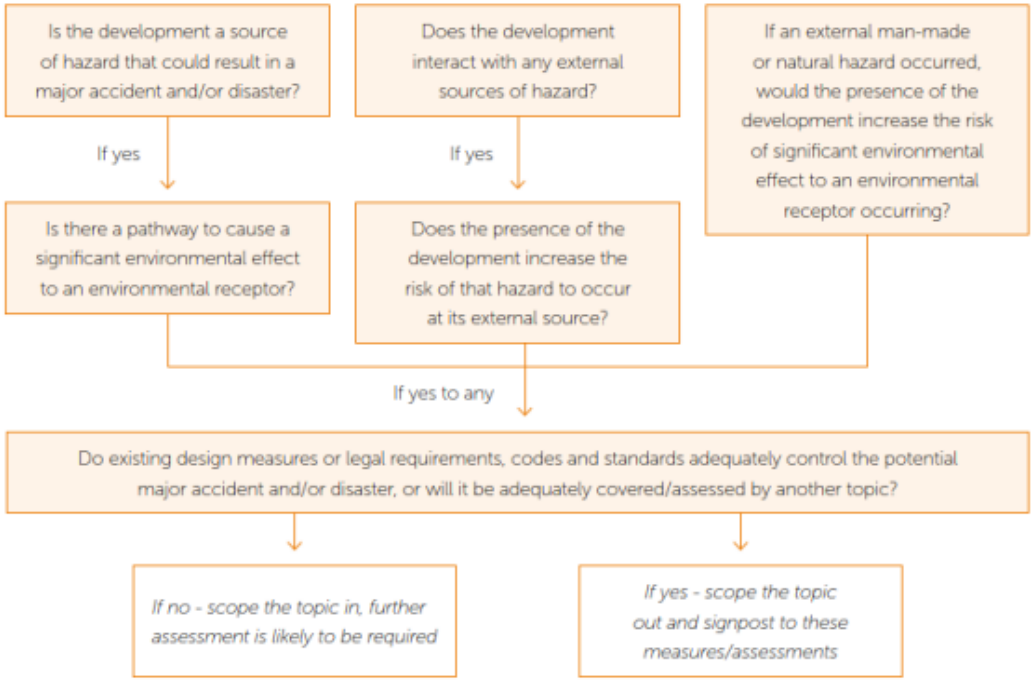
For the purpose of this assessment the following definitions, defined in the Institute of Environmental Management and Assessment (IEMA) document *Major Accidents and Disasters in EIA: A Primer* (September 2020), are used:

- Major Accidents: Events that threaten immediate or delayed serious environmental effects to human health, welfare and / or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.
- Disaster: May be a natural hazard (e.g. earthquake) or a man-made / external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.
- Risk: For a risk to arise there must be hazard that consists of a 'source' (e.g. high rainfall); a 'receptor' (e.g. people, property, environment); and a pathway between the source and the receptor (e.g. flood routes).
- Vulnerability: Describes the potential for harm as a result of an event, for example due to sensitivity or value of receptors. In the context of the EIA Directive, the term refers to the 'exposure and resilience' of the development to the risk of a major accident and / or disaster. Vulnerability is influenced by sensitivity, adaptive capacity and magnitude of impact.

17.3 Methodology

The methodology applied is based on the scoping decision process flow provided in Figure 17.1 Scoping Decision Process Flow. The potential for source, pathway, receptor linkages is first established having regard to the location, type, context, existing and future constraints and likely receptors relevant to the proposed development.

Figure 17.1: Scoping Decision Process Flow



Source: Major Accidents and Disasters in EIA: A primer (IEMA, September 2020)

17.4 Receiving Environment

The Moneypoint Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0605-04), regulated by the Environmental Protection Agency (EPA).

It is not proposed to change any of the existing emission limit values in the IE licence. ESB has sought a BAT conclusion Technical Amendment in December 2023 on the existing IE licence from the EPA namely to add the proposed auxiliary boiler stack as an emission point. Ultimately the EPA is the competent authority in relation to the IE licence, emissions and environmental management.

The heavy fuel oil (HFO) will be stored in two existing and two proposed tanks located in a bunded area. The existing bund will be upgraded to include a concrete floor across the entire bund, to ensure containment volumes of ca.30,186m^3 in the western bund and ca.30,239m^3 in the eastern bund (refer to Section 4.3.2 for further details). The total volume of on-site HFO storage following proposed works is 100,000 tonnes. As discussed in Section 4.5.7, HFO is currently delivered to site by ship and pumped via existing pipelines from the jetty to the tanks, this arrangement will remain unchanged following proposed works.

The Moneypoint site also contains two distillate (diesel) storage tanks, for the purposes of start-up combustion, each with a capacity of 300 tonnes. These tanks are situated in a common bund with a storage capacity of 1,008m^3. There are also 2 no. tanks containing diesel for the purposes of vehicle refuelling, with capacities of 20m^3 and 15m^3. The 15m^3 diesel tank is bunded and the 20m^3 tank is double-skinned. All diesel tanks are located adjacent to the HFO bunds to the north of the main site buildings. No increase is proposed in diesel storage. Diesel deliveries are carried out by road currently and this arrangement will also remain unchanged following proposed works.

The proposed development has been subject to a Land Use Planning Assessment in accordance with the Health and Safety Authority (HSA) Guidance. A copy of the Land Use

Planning Report COMAH assessment prepared by PM Group is provided in Appendix D of this EIAR. The HSA land use planning department have been informed of the proposed planning application.

PM Group on behalf of ESB has also developed a Significant Modifications Report for the proposed development, and this will be forwarded to the HSA as the competent authority.

A list of chemicals expected to be stored on site is provided in Section 4.5.9.

17.5 Likely Significant Impacts

Table 17.1 considers the likelihood of significant adverse effects on the environment deriving from the vulnerability of the proposed development to risks of relevant major accidents and/or disasters.

Where sources/interactions and pathways have been established, an assessment is carried out as to whether or not design measures, or legal requirements, codes and standards adequately control the potential major accident and/or disaster. Reference is made to other technical chapters of the EIAR, where appropriate.

In addition to Table 17.1, the COMAH Technical Land-use Planning assessment (Appendix D), concludes that the risk of a major accident at the ESB Moneypoint site as a result of the proposed development is acceptably low with respect to the Land-use Planning criteria.

Table 17.1: Likely Significant Adverse Effects

Source and /or pathway /receptor	Reasonable Worst-case consequence	Embedding Mitigation	Could this result in a major accident and /or disaster with mitigation in place	Is the reasonable worst consequence managed to an acceptable level with existing mitigation in place	Likely significant Adverse Effects
Flooding					
Tidal flooding could cause failure to electrical components	The proposed development is located *directly adjacent to Shannon Estuary.* However, flood risk assessment prepared by ESB indicates that the site is located in Flood Risk Zone C. The proposed site is not located within an area considered to be at risk of flooding from the estuary.	The proposed site lies within Flood Zone C as defined by the Guidelines document to Planning Authorities in relation to Flood Risk Management.	No. The lowest level of the development site is 5.65moD (ESB, FRA 2023[178]) which is above the predicted flooding level scenarios for Shannon Estuary. This proposed development will not result in loss of floodplain as the site boundary is outside the area vulnerable to flooding.	Yes	None. Flood risk is discussed in Chapter 11.
Fire					
HFO/diesel fire scenario	Catastrophic tank failure ensuing fire	Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. An “Emergency Procedure in the Event of Fire” is in place in relation to HFO storage and handling. The refurbished bunds have been sized such that, in an event of a fire, they will be able to contain the full volume of one of the tanks plus recommended allowances for firefighting and cooling water, firefighting agents, dynamic effects and rainfall.	No	Yes	No likely significant adverse effects. Discussed separately in the COMAH Technical Landuse Planning Report provided in Appendix D

[178] Flood Risk Assessment (ESB, 2023), see Appendix H.2.

Source and /or pathway /receptor	Reasonable Worst-case consequence	Embedding Mitigation	Could this result in a major accident and /or disaster with mitigation in place	Is the reasonable worst consequence managed to an acceptable level with existing mitigation in place	Likely significant Adverse Effects
Extreme temperature (heatwave, cold snap) high winds storm					
Design standards mitigate against extreme temperature	None. Major accidents disasters are unlikely	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Electricity Failure					
Electricity failure can be caused by several factors such as extreme weather conditions.	Loss of power supply resulting in disruption to the operation of the plant	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Exposure to High Voltage					
Construction workers and maintenance staff coming in contact with exposed live conductors	Risk of damage or harm	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Major Road traffic accident					
Movement of construction vehicles debris striking traffic /member of public	Death and or injury to a member of the public. Delays and congestion in surrounding area	Controls to be implemented through traffic management, construction planning and method statements	Yes	Yes	No likely significant adverse effects, this is screened out in Chapter 15 Traffic and Transport.

Source and /or pathway /receptor	Reasonable Worst-case consequence	Embedding Mitigation	Could this result in a major accident and /or disaster with mitigation in place	Is the reasonable worst consequence managed to an acceptable level with existing mitigation in place	Likely significant Adverse Effects
Earthquake					
An earthquake of sufficient intensity to inflict severe damage is unlikely	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Biological hazard – epidemic, pandemic					
Apart from construction workers and maintenance staff the proposed development does not generate human interaction. The proposed development also does not generate interaction with animals. Construction phase activities will be carried out in accordance with Government guidelines	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Malicious attacks/ cyberattack					
The proposed development will feed into Ireland's electrical transmission grid	Damage would likely be limited to disruption of the station's ability to operate until the damage was repaired	The site is secured by high fences with security gates, operated by security personal. ESB & EirGrid also have IT security measures in place at Moneypoint.	No	Yes	No likely significant adverse effects. Loss of functionality to the proposed development only, no

Source and /or pathway /receptor	Reasonable Worst-case consequence	Embedding Mitigation	Could this result in a major accident and /or disaster with mitigation in place	Is the reasonable worst consequence managed to an acceptable level with existing mitigation in place	Likely significant Adverse Effects
and could be subject to malicious physical or cyber attack					environmental impacts
Contaminated land /Groundwater					
Construction of the stack/aux boiler house and HFO bunds may temporarily mobilise residual contamination during installation	Release of hydrocarbons and other pollutants to the receiving environment	Contaminated materials identified during site works will be subject to review and additional risk assessment and, if necessary, remediation and/or removal. All construction works will be carried out in accordance with the CEMP. All materials to be moved are to be classified according to Waste Management Act (1996) and subject to a materials management plan set out in the RWMP	No	Yes	Land, soils and hydrogeology are discussed in Chapter 12
Spillage or seepage of pollutants into watercourse/ ground					
HFO spill on site	Oil seepage into the ground which could lead to contamination of the soil and Shannon Estuary	The HFO tank bund is designed to take into account 110% of the largest tank oil volume, a potential extreme rainfall event to cover any emergency response periods and an additional 3,981m^3 for any potential firefighting water to take into account requirements in the Guidance Note to Industry on Fire Water Retention Facilities (EPA, 2019) and CIRIA Guidance C736. There are emergency response plans in place for handling oil spills.	No	Yes	Surface Water is discussed in Chapter 11 and Land, Soils and Hydrogeology are discussed in detail in Chapter 12
HFO spill from tankers	Oil spill into the Shannon estuary during delivery and unloading of HFO	Measures will be implemented during the transit of the HFO vessels to Moneypoint including that the oil tankers shipping the HFO will have regard to the International Safety Guide for Oil Tankers and	Yes	Yes	Surface Water is discussed in Chapter 11 and Biodiversity is

Source and /or pathway /receptor	Reasonable Worst-case consequence	Embedding Mitigation	Could this result in a major accident and /or disaster with mitigation in place	Is the reasonable worst consequence managed to an acceptable level with existing mitigation in place	Likely significant Adverse Effects
	ships which could lead to potential impacts to the water quality of the estuary and associated habitats.	Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS). In addition, the recommendations of the International Maritime Organisation will be reviewed and implemented, as necessary. Measures are also in place for HFO unloading to avoid oil spill and contain oil in event of emergency. An Oil Spill Response Plan prepared by ESB is also in place within the Moneypoint site.			discussed in Chapter 10

17.6 Mitigation and Monitoring Measures

In the different stages of the project lifetime several best practice mitigation measures will be implemented, relevant to major accidents and disasters, as detailed through the Construction Environmental Management Plan (CEMP) to ensure minimal impacts relating to Major Accidents and/or emergencies.

17.7 Residual Impacts

Significant adverse effects as a result of the proposed development on the environment deriving from the vulnerability of the proposed development to risks of major accidents and/or disasters are not considered likely.

18 Interactions between Environmental Factors

18.1 Introduction

This chapter describes the interactions between the various likely significant impacts of the proposed development identified in this EIAR.

Aspects of the existing environment likely to be affected by the proposed development have been considered in detail in the relevant chapters of this EIAR.

18.2 Interaction of Effects and Indirect Effects

The matrix presented in Table 18.1 has been developed to identify interactions and indirect impacts between environmental topics. The nature of the environment is such that interactions between all environmental topics are potentially possible and / or may occur to a certain extent for most projects.

The purpose of the matrix is therefore to highlight key interactions that are recognised to be specific to this proposed development and warranting special consideration. In the matrix, a blank square indicates no interaction, while a turquoise square indicates that a key interaction exists.

Key environmental interactions that have been identified are discussed further in Table 18.2.

Table 18.1: Interaction of Effects

Interaction of Effects between the Factors	Population and Human Health	Air Quality	Climate	Noise and Vibration	Biodiversity	Surface Water Resources and Flooding	Land, Soils and Hydrogeology	Archaeology, Architectural and Cultural Heritage	The Landscape	Traffic and Transport	Material Assets and Waste Management	Major Accidents and/or Disasters
Population and Human Health		■	■	■		■	■		■	■	■	■
Air Quality	■		■		■					■		
Climate	■	■				■				■		
Noise and Vibration	■				■					■		
Biodiversity		■		■		■						
Surface Water Resources and Flooding	■		■		■							
Land, Soils and Hydrogeology	■							■			■	
Archaeology, Architectural and Cultural Heritage							■					
The Landscape	■											
Traffic and Transport	■	■	■	■								
Material Assets and Waste Management	■						■					
Major Accidents and/or Disasters	■											

Table 18.2: Interaction of Effects – Description

Interaction or Indirect Effect	Description
Population and Human Health Interactions with: Air Quality, Climate, Noise and Vibration, Surface Water Resources and Flooding, Land, Soils and Hydrogeology, The Landscape, Traffic and Transport, Material Assets and Waste Management, and Major Accident and/or Disasters	**Air Quality**: An inter-relationship link between Population & Human Health and Air Quality exists. An Air Quality assessment was carried out, and is presented in Chapter 7 of the EIAR. The main potential impact relates to dust generation during construction activities. The potential impacts for dust soiling have been assessed in Chapter 7 and mitigation measures recommended. In circumstances where the appropriate mitigations measures identified are fully implemented during the construction and operational phases, the impact of the proposed development will be imperceptible. No exceedances of the AQS are predicted as a result of the operation of the proposed development, both when operating in isolation and cumulatively. The increases in pollutant concentrations as a result of the proposed development are also small. Therefore, the impact of the proposed development at nearby human health and offsite receptors is considered not significant. The generation of electricity is a licensed activity under the IE licensing regime, as regulated by the EPA and the proposed development is consistent with established activities on the site. ESB made a Request Technical Amendment for Best Available Techniques (BAT) Conclusions to the EPA on 15 December 2023 to regularise the proposed development under the IE licence. **Climate**: A Climate assessment was carried out, presented in Chapter 8 of the EIAR. Although the proposed development is still based on the use of fossil fuels, replacing coal with HFO will reduce the operational CO_2e emissions by ca.29% compared with current operations. This project is temporary with limited running hours and will cease generation in 2029. The proposed development will act as an out of market generator of last resort and will operate only when required by the Transmission System Operator (EirGrid) for security of supply reasons. The emissions during construction phase are estimated at approximately 1% of annual operating emissions and therefore regarded as not significantly changing the result of the impact assessment. The emissions from the operation of the proposed development are expected to be major adverse and significant. The proposed development has a 12% lower emissions intensity than the existing coal-fired plant, and presents lower emissions through transition to HFO than a 'do nothing' scenario with continued use of coal. **Noise and Vibration**: There is the potential for interactions between population and noise. This interaction has been discussed in Chapter 9 of this EIAR. The significance of effect due to construction and operational noise is Not Significant as the predicted noise levels at Noise Sensitive Locations (NSLs) are below the threshold limits. The predicted levels of vibration fall below the thresholds for the disturbance of occupant of buildings and for potential building damage and therefore, the significance of effect due to construction vibration is Not Significant. It also concludes that the end of coal yard operations would have slight benefit to the NSLs in terms of operational noise level. Surface Water Resources and Flooding: Surface Water: The main interaction between Population & Human Health and Surface Water relates to the potential impact of the proposed development on the surface water quality from sediment runoff, spillages and dischargers to receiving surface waters. An assessment of the construction and operation of proposed development has been undertaken in Chapter 11. In circumstances where the appropriate mitigations measures identified are fully implemented during the construction and operational phases, the impact of the proposed development on the water quality in the area will be imperceptible. The proposed development is therefore not expected to have a significant effect on the water quality of the receiving waters. Flood Risk Assessment: The main interaction between Population & Human Health and Flood Risk Assessment relates to the potential impact of the proposed development on flooding. The proposed development site is located adjacent to the Shannon Estuary. A Flood Risk assessment has been prepared which shows the proposed site is located in Flood Risk Zone C where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Therefore the risk of potential flooding due to proposed development is determined to be imperceptible therefore the risk to human health is considered low.

Land, Soils and Hydrogeology: The main interaction between Population & Human Health and Land, Soils and Hydrogeology relates to the potential impact of contaminated land. As outlined in Chapter 12, any contamination discovered during the construction will be assessed using a Contaminated Land Risk Assessment (CLRA). Where a significant risk to human health or controlled waters is identified the contamination will be remediated on-site or excavated and disposed of as waste. During construction and operational phase, contamination management will comply with all relevant legislation, including the existing IE licence and will be undertaken in consultation with the EPA and any other relevant authorities. This is also outlined in the CEMP (Appendix C of this EIAR) for the construction phase. Provided the appropriate mitigations measures identified in Chapter 12 are fully implemented the impact of the proposed development is deemed to be not significant.

The Landscape: There is the potential for interactions between population and human health and the landscape. This was assessed in Chapter 14 with the assessment concluding that the proposed development will not give rise to significant landscape and visual impacts.

Traffic and Transport: During construction, there will be a temporary increase in traffic levels and potential impacts on the local community. No road closures or lane closures are anticipated throughout the construction phase and therefore there is no requirement for traffic diversion. The impacts on driver delay, road safety and community effects due to proposed construction traffic are assessed in Chapter 15 Traffic and Transport. During construction, traffic will be managed in accordance with the Traffic Management Plan to ensure minimal disruption to local receptors. During operation, traffic volumes for the proposed development will be similar to those associated with the existing development. Nonetheless, it is recognised as good practice to implement a Workplace Travel Plan (WTP) to promote sustainable transport use and discourage single vehicle occupancy travel. In circumstances where the appropriate mitigations measures identified in Chapter 15 and the TMP are fully implemented, the impact of the proposed development is deemed to be not significant.

Material Assets and Waste Management: The main interaction between Population & Human Health and Material Assets and Waste Management relates to the potential impact of the generation of C&D waste and removal of C&D waste from site during construction activities. As outlined in Chapter 16, all operations will be managed and programmed in such a manner as to prevent / minimise waste production and the waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Waste arisings will be handled, stored, managed and re-used or recycled as close as practicable to the proposed works. Any waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment. All employees will be made aware of their obligations under the CEMP and the RWMP. In circumstances where the appropriate mitigations measures identified in Chapter 16 are fully implemented the impact of the proposed development is anticipated to be not significant during construction phase and imperceptible during operational phase.

Major Accidents & Disasters: The Moneypoint Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0605-04), regulated by the EPA. Moneypoint Generating Station is also listed as an ‘Upper Tier establishment’ under the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (which transposes and implements the Seveso III Directive (2012/18/EU)) and is subject to regular routine inspection by the Health and Safety Authority (which is the Central Competent Authority for the Regulations). The proposed development has been subject to a Technical Land Use Planning (TLUP) Assessment in accordance with the HSA Guidance. It concludes that the risk of a major accident at the ESB Moneypoint site as a result of the proposed development is acceptably low with respect to the Land-use Planning criteria. The assessment also notes that it is considered unlikely that human health would be significantly affected, directly or indirectly, in an event of HFO spill. A copy of the TLUP assessment is provided in Appendix D of this EIAR. The HSA land use planning department have been informed of the proposed planning application.

Air Quality interactions with: Climate. Biodiversity, and Traffic and Transport	**Climate:** An inter-relationship link exists between operational air emissions and climate change. Chapter 8 notes an estimate of emissions for HFO combustion, based on consumption of 216 tonnes of HFO/hour over 3,000 hours of annual operation. It states that replacing coal with HFO will reduce the operational CO_2e emissions by ca.29% compared with current operations. Chapter 8 concludes that emissions from the operation of the proposed development are expected to be major adverse and significant. Mitigation measures are not quantified at this stage of assessment and therefore residual impacts are the same. **Biodiversity:** There is potential for interactions between air quality and biodiversity. This interaction is discussed in Chapter 10 of the EIAR. It notes that there is potential for impacts on vegetation due to dust deposition and suggests measures for dust control. In circumstances where the appropriate mitigations measures identified are fully implemented, the impact of the proposed development will not result in significant impacts. In Chapter 10 critical levels (atmospheric NOx and SO_2) modelling has been carried out for the proposed development. It concludes that the increases in NOx and SO_2 concentrations as a result of the proposed development are small relative to the background concentrations adopted for the assessment and would not result in exceedances of the AQS for NOx or SO_2. On this basis, the direct impacts from atmospheric NOx and SO_2 at ecological sites are negligible. Critical loads (Nitrogen and acidification) contributions to nitrogen deposition (eutrophication) and acid deposition (acidification) at designated sites has been derived from the dispersion modelling, for designated sites including the Lower River Shannon SAC and Tullagher Lough and Bog SAC. The critical loads for nitrogen and acid deposition are greater than significance level of 1% of the minimum critical load; however, they will be less than for the current coal operation and there is, therefore, no potential for significant effects nor effects on vegetation qualifying interests. Such impacts are thus screened-out for these pathways. **Traffic and Transport:** An inter-relationship link between Traffic and Transport and Air Quality exists. With regards to construction and operational road traffic emissions, the proposed works do not meet the criteria set out in appropriate guidance (see Chapter 7 for details) for the effects of construction and operational traffic on air quality to be considered significant. The main potential impact relates to dust generation arising during construction activities. The potential impacts for dust soiling have been assessed in Chapter 7 and a number of mitigation measures recommended. In circumstances where the appropriate mitigations measures identified are fully implemented during the construction phases, the impact of the proposed development will be imperceptible.
Climate interactions with: Surface Water Resources and Flooding, and Traffic and Transport	**Surface Water Resources and Flooding**: The impact of climate change on hydrology increases the potential for future flood risk. The latest climate change guidance was considered when assessing the potential impact of flood risk and drainage within the Moneypoint Generating Station Complex. A Flood Risk Assessment (FRA) report for the proposed development site has been prepared by ESB (Document no. QP-000017-65-R460-002-000). The FRA report was prepared in accordance with the Planning System and Flood Risk Management, Guidelines for Planning Authorities (OPW, 2009), and is included in Appendix H of this EIAR. The FRA concludes that the site is located in Flood Risk Zone C where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding), including allowance for climate change. Chapter 11 of this EIAR notes that due to the existing topography at the Moneypoint Generating Station complex there are no areas which will be impacted in the event that High End Future Scenario coastal flood levels occurred. **Traffic and Transport**: There exists a link between construction traffic and carbon assessment as presented in Chapter 8. The estimated emissions from construction traffic are approximately 220 tCO_2e as compared to the total estimated emissions of approximately 9,150 tCO_2e. Emissions split by lifecycle stage for construction (Figure 8.2) show that 2% of emissions are attributed to transport, as compared to 3% of emissions due to production of materials and 95% due to construction plant. Chapter 8 incudes mitigation measures for transport of materials to site.
Noise & Vibrations Interactions with: Biodiversity, and Traffic and Transport	**Biodiversity:** There is the potential for interactions between Biodiversity and Noise and Vibration. Construction noise and vibration, especially associated with any piling works required, could affect birds, bats, marine and terrestrial mammal species. Birds, both terrestrial and shoreline, might be affected up to 253m of the site. Otters and badgers, might be affected up to 150m from the site. Bats might be affected up to 6km from the site, and marine mammals might be affected up to 500m from the site. These moderate, temporary effects are

	not likely to result in significant effects as the site is industrial and most fauna using the area are likely habituated to the noise levels on-site. Additionally, and for the piling work, as the piling will take place on-, and not off-, shore, albeit adjacent to the Shannon estuary, the impact of piling vibration will likely be less than the stated 500m, and likely outside the main use areas of marine mammals. It is not proposed to change any of the existing emission limit values in the IE licence. The proposed development will require an update to the existing IE licence from the EPA, namely, to add the proposed auxiliary boiler exhaust stack as an emission point. Ultimately the EPA is the competent authority in relation to the IE licence, emissions and environmental management. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. However, HFO ships are generally much smaller compared to a coal ship. It takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship. Underwater noise will be reduced as a result of the proposed development as the coal shipments are eliminated. In terms of operational noise, noise levels are modelled as being well below 55dB (ca. 30-40dB) – this is a low noise level effect (Cutts et al., 2013) and is not likely to have a significant effect on water birds. There is potential for a temporary increase in personnel and machinery presence during HFO delivery events which may disturb species, however these events will be brief and infrequent (ca. 2 events per year). **Traffic and Transport**: There exists an inter-relationship between traffic and noise. Chapter 9 presents an assessment of temporary changes in road traffic noise as a result of proposed construction works. It notes that the predicted increase in the Basic Noise Level for road traffic noise (L10 dB(A)), based on the daily average road traffic parameters for the N67 and N68 roads in the year 2025 and forecasted additional movements, are +1.0 dB and +0.3 dB respectively. Although there is a predicted +1.0 dB increase for N67 under the worst case scenario, it is concluded that the likely significance of effect due to construction traffic is Not Significant.
Biodiversity Interactions with: Surface Water Resources and Flooding	**Surface Water Resources and Flooding:** There is the potential for interactions between Biodiversity and Surface Water Resources. During construction there is a potential for silt to runoff exposed surfaces. High risk activities such as pouring concrete and refuelling vehicles will also have the potential to cause polluted runoff which may enter unprotected drains. Polluting matter entering drains has the potential to discharge to Lower Shannon Estuary in the south. The magnitude of any such pollution incidents is likely to be moderate/large, presenting a significant profound adverse impact of temporary duration on the Lower Shannon Estuary SAC/SPA prior to implementation of mitigation measures. This interaction has been assessed in Chapter 10 and Chapter 11 of this EIAR, and a number of mitigation measures recommended. Ship delivery numbers are proposed to remain similar in frequency to firing at baseload with coal at up to 24 ships per year. The risk from accidental spillage of HFO from shipping vessels in transit, or during the unloading is considered highly unlikely. Also, HFO is highly viscous and it must be heated in order to pump or pour it as it solidifies once cooled and is therefore less mobile. HFO ships are generally much smaller than the average coal ship. It takes 2-4 days to unload a HFO ship compared with 2-3 weeks to unload a coal ship. A “procedure for unloading oil ships”, shore side check list for ship unloading and “Oil Spill Response Plan” is in place on site which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills. There is also a spill containment area to capture any spills that might occur at the unloading arm. Moneypoint is a member of the Shannon Estuary Anti-Pollution Team (SEA-PT). The group consists of the Port Company, Local Authorities, Offshore Industry and Oil Importers and was initiated to form a unified coordinated response to pollution incidents on the Shannon Estuary. Emergency response exercises are conducted periodically with SEA-PT and Moneypoint also periodically do their own emergency response exercises. The receiving waterbody is considered to be of Extremely High sensitivity. In an unlikely event of oil spill in the Lower Shannon Estuary there will be potential temporary to permanent significant adverse effect to the water quality in the absence of mitigation. In circumstances where the appropriate mitigations measures identified are fully implemented, the impact of the proposed development will not result in significant impacts. During the construction and

	operational phases, impacts on fauna sensitive to disturbance (noise, light and visual), Annex I habitats, water quality and associated aquatic receptors are anticipated to be localised, short term in duration and of slight significance.
Lands, Soils and Hydrogeology Interactions with: Architecture, Archaeology and Cultural Heritage, and Material Assets and Waste Management	**Architecture, Archaeology and Cultural Heritage:** As with any civil construction works of this nature, there is potential for previously unrecorded archaeology to be encountered during excavation works. Disturbance of ground within newly acquired lands may impact unrecorded archaeology and cultural heritage. As the site is already developed, no requirement for archaeological monitoring is recommended within the proposed development area. The impacts of the proposed development on cultural heritage have been assessed and mitigation measures recommended, for example should excavation occur within the proposed ASA, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered mechanical excavation will cease and the County Archaeologist, and the National Monuments Service shall be notified. Further work will then only be carried out following consultations with the National Monuments Service.The implementation of these measures will ensure that such impacts are minimised. **Material Assets and Waste Management:** The disturbance of soil during the construction phase of the proposed development has the potential to undercover contaminated or hazardous land. Best practice techniques, mitigation measures and guidelines have been outlined in Chapter 12 Land, Soils & Hydrogeology and the Construction Environmental Management Plan (Appendix C of this EIAR). As outlined in Chapter 16, all operations will be managed and programmed in such a manner as to prevent / minimise waste production and maximise upper tier waste management (i.e. re-use, recycle, and recovery) in line with the Waste Hierarchy where technically and economically feasible. Waste arisings will be handled, stored, managed and re-used or recycled as close as practicable to the point of origin. Any wastes sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment. All employees will be made aware of their obligations under the CEMP. In circumstances where the appropriate mitigations measures identified in Chapter 12 are fully implemented the impact of the proposed development will be imperceptible.

19 Summary of Mitigation Measures

19.1 Introduction

This chapter summarises the mitigation controls and other best practice measures identified in relation to the proposed development and sets out the means by which those controls and measures will be secured. These are presented in Table 19.1 where the following are provided:

- A unique reference number for each item;
- The phase the mitigation measure refers to; and
- The monitoring and mitigation measures, as set out in the EIAR.

A contractual obligation will be included within the tendering processes and implemented on appointment of the Contractor to ensure that the proposed works are developed in compliance with the requirements of the CEMP, and the methods, monitoring and mitigation included in this EIAR.

Table 19.1: Summary of Mitigation and Monitoring Measures

Discipline	Phase	Mitigation and Monitoring
Chapter 6 Population and Human Health		
6.1	Construction	All work will be carried out having regard to international and national legislation, and best practice guidance, as detailed in the topic specific chapters of this Environmental Impact Assessment Report (EIAR).
6.2	Construction	A Construction Environmental Management Plan (CEMP) is included in Appendix C of the EIAR. The CEMP will be implemented during the construction phase to safeguard the environment, site personnel, and nearby receptors, i.e. occupiers of residential and commercial properties, from site activities which may cause harm or nuisance.
6.3	Construction	The appointed contractors (in collaboration with ESB) will be required to maintain close liaison with local community representatives and statutory consultees throughout the construction period. This is likely to include circulation of information about ongoing activities; particularly those that could potentially cause disturbance. A telephone number will be provided and persons with appropriate authority to respond to calls and resolve or escalate any problems arising will be available. All construction activities will be managed through the site CEMP and Traffic Management Plan (TMP). There are no specific mitigation measures proposed to ameliorate impacts on population and human health in addition to the measures specified elsewhere in this EIAR.
Chapter 7 Air		
7.1	All Phases	The Moneypoint Generating Station has an appointed community liaison that acts as a point of contact for the local community should any issues arise in the vicinity of the plant that require action from the operator. This role would continue during the proposed development construction, operation and maintenance phases.
7.2	Construction	Best practice mitigation measures to control the generation of dust during demolition of the coalyard as outlined in the IAQM guidance[179] are presented below. Communications: ● develop and implement a stakeholder communications plan that includes community engagement before work commences on site; ● display the name and contact details of person(s) accountable for air quality and dust issue on the Scheme boundary. This may be the environment manager/ engineer or the site manager; ● display the head or regional office contact information; and ● develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions. This DMP can be provided to Clare County Council for approval, if requested.
7.3	Construction	Site management: ● 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; ● make the complaints log available to Clare County Council when asked; and

[179] Institute of Air Quality Management (2023) *Guidance on the assessment of dust from demolition and construction*.

Discipline	Phase	Mitigation and Monitoring
		● 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 log book.
7.4	Construction	Prepare and maintaining the site: ● plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; ● fully enclose site or specific operations where there is a potential for dust production and the site is active for an extensive period; ● avoid site runoff of water or mud; ● keep site fencing, barriers and scaffolding clean using wet methods; ● remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site, if they are being re-used on-site cover as described below; and ● cover or fencing stockpiles to prevent wind whipping.
7.5	Construction	Waste management: ● no burning of waste materials.
7.6	Construction	Mitigation specific to dismantling of Coalyard: ● ensure effective water suppression is used during dismantling operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems manually controlled can produce fine water droplets that effectively bring the dust particles to the ground; and ● bag and remove any biological debris or damp down such material before dismantling.
7.7	Construction	The following dust monitoring measures are to be implemented during dismantling of the coalyard: ● continue to undertake monitoring of dust deposition using mass deposition (Berghoff) gauges at the four existing monitoring sites surrounding the coal yard and Ash Storage Area (ASA). The sampling interval, analytical technique and threshold should remain the same; ● undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority, if asked. This will include regular dust soiling checks of surfaces including cars and window sills within 100m of proposed development boundary to ensure dust control measures are effective; ● carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the Local Authority when asked; and ● increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
7.8	Operational	Operation vehicle/machinery and sustainable travel: ● ensure all vehicles switch off engines when not in use – no idling vehicles; ● avoid the use of diesel or petrol power generators and use mains electricity, battery powered equipment or other alternative with no emissions to air, where practicable; ● impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas;

Discipline	Phase	Mitigation and Monitoring
		● produce a construction logistics plan to manage the sustainable delivery of goods and materials; and ● implement a travel plan that supports and encourages sustainable travel.
7.9	Operational	Operations: ● only use cuttings, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems; ● ensure an adequate water supply on the site for the effective dust/ particulate matter suppression/ mitigation, using non-potable water where possible and appropriate; ● use enclosed chutes and conveyors and covered skips; ● minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and ● ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
7.10	Operational	The site will continue to operate under an IE Licence, which sets limits on emissions to air, enforces monitoring and reporting requirements, set out environmental management measures and complaint management measures. All works need to be agreed in advance with the Environmental Protection Agency (EPA). Works within the ASA must comply with the site's agreed Landfill Operational Plan and any decommissioning works must be in compliance with the site's DMP. The following dust control measures are set out in the Landfill Operational Plan[180] to limit the potential for adverse impacts from dust at the ASA and landfill. These dust control measures will continue to be applied during the operation of the proposed development. ● The material dispatched from the batching plant will be conditioned with water leading to the material having the characteristics of lean mix concrete. ● Any conveyors used in material transport or placement will be contained. ● Material placed in the ASA will be immediately compacted which contributes to reduction of potential dust generation. ● Material placed, being placed or moved within the active landfill cell will receive additional wetting by water bowser where conditions may lead to fugitive dust emissions. If these means of dust control become inadequate due to extreme adverse weather conditions, material placement will stop until the weather conditions improve. ● On completion of each cell, the cell will be capped using ca.47.5% Flue-gas desulfurization (FGD) by-product, ca.47.5% Ash and ca.5% cement mixture of minimum 0.6m thickness, and up to 1.6m with the proposed development, which in turn will be covered by a drainage layer, subsoil and topsoil layers. As was previously permitted, once complete the final profile will resemble a dome-like shape and will be finished with a layer of topsoil and seeded with meadow grass mix of native provenance. The capping and covering of each landfill cell on completion will minimise the potential for dust mobilisation from completed landfill areas.

[180] Landfill Operational Plan, Moneypoint Generating Station, April 2005.

Discipline	Phase	Mitigation and Monitoring
		In addition to the measures included in the Landfill Operation Plan, dust control measures presented as Measures 7.2 to 7.6 in this table with regards to 'site management' will be applied to any activities involving the removal of ash for sale or reuse in operational plant activities. All sales of ash involving exporting the material from the site will be undertaken using vehicles with covered loads to prevent escape of materials during transport. The proposed development includes increased thickness of the stabilised FGD by-product capping layer which is expected to provide a more effective capping layer to each landfill cell further reducing the potential for dust emissions.
7.11	Operational	For the operational scenarios associated with the proposed development no mitigation measures in addition to those already inherent to the design of the proposed development are required. It should be noted that the proposed development will be licensed by the EPA under the industrial emissions licensing process. The licence will state the limits for atmospheric emissions that the proposed development will be required to comply with.
7.12	Operational	Emissions from the existing boilers are currently monitored by a Continuous Emissions Monitoring System (CEMS). The CEMS would continue to operate with the proposed development and would be used to demonstrate compliance with the emission limits specified in the IE licence. Emissions of NOx and CO[181] from the diesel auxiliary boiler would be monitored on a periodic annual basis in accordance with the requirements contained within Annex III Part 1 of the Medium Combustion Plant Directive[182] (MCPD).
Chapter 8 Climate		
8.1	Construction	Integrate Greenhouse gas (GHG) emissions reduction from the early design stage, promoting GHG saving opportunities when determining the definitive specifications of products, materials, and layouts, and explore alternatives to achieve the desired development. For example, the proposed development has set a specification to use cement replacers to reduce the embedded emissions in manufacturing the concrete (35% ash as cement replacer), where technically practicable.
8.2	Construction	Take a planned approach focused on GHG emissions reduction, using good construction practices and energy efficient processes and technologies, including the re-use or refurbishing of existing assets.
8.3	Construction	Promote fuel switching or substitution in transport of materials to site, as well as efficient route scheduling with suppliers.
8.4	Construction	Design for decommissioning to reduce wastage of materials and enable reuse of components where appropriate.
8.5	Operational	Regular maintenance checks to ensure that the station and other equipment are operating according to calculated efficiency rates and that best practice control measures will be implemented to mitigate against GHG emissions.
8.6	Operational	Application of the circular economy hierarchy, reduce, re-use, repair and recover when maintenance is undertaken, as well as use of good practices by value-chain members.
8.7	Operational	Promote fuel switching or substitution in transport of fuel and other consumables to site, as well as efficient route scheduling with suppliers.
8.8	Operational	Continue with monitoring and reporting fuel shipment data and bimonthly sample data for Heavy Fuel Oil (HFO), including the calculation of GHG emissions, as per GHG permit.

[181] Monitoring is required for pollutants for which an emission limit value is laid down in the MCPD. Monitoring of CO is required for all plants regardless of technology or fuel.

[182] European Union. (November 2015), 'Directive (EU) 2015/2193 if the European Parliament and the council of 25 November 2015 on the limitation of emission of certain pollutants into the air from medium combustion plants'

Discipline	Phase	Mitigation and Monitoring
Chapter 9 Noise and Vibration		
9.1	Construction	The mitigation measures will adhere to the British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, 2009 + A1:2014 and British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites –Part 2: Vibration, 2009 + A1:2014. Noise emissions will be minimised at source, in accordance with best practice, to minimise the exposure site personnel to noise from construction and operational plant. However, the existing ELVs and monitoring as required under the IEL will be continued.
9.2	Construction	The CEMP will be implemented during the construction phase to minimise any construction noise and vibration impacts. A CEMP will be implemented during the construction phase in consultation with Clare County Council. The contractor is obliged to comply with Local Authority controls on noise and vibration during construction. This will include (but is not limited to) the setting of limits for the control of noise and vibration from construction activities, the provision of mitigation measures required whilst adopting best practicable means, and any noise or vibration monitoring where significant adverse effects are required to be monitored. A comprehensive noise and vibration monitoring protocol will also be implemented. As part of the CEMP, the Contractor will also develop and implement a stakeholder communications plan which will facilitate community engagement prior to the commencement of construction.
Chapter 10 Biodiversity		
10.1	Construction	● An Environmental Clerk of Works (EnCoW) will be employed to oversee implementation of mitigation and deliver toolbox talks and preconstruction confirmatory ecology surveys, as appropriate. This will include monitoring and auditing works and programmes, as well as works method statements, to ensure mitigation is correctly implemented and that impacts to Key Ecological Receptor (KER) habitats, and other non-made ground habitats, preferably avoided, or at least minimised, where practical. ● The EnCoW will also manage consultation with environmental bodies including the National Parks and Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI). The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents. ● It will be ensured that the EnCoW is delegated sufficient powers under the construction contract so that they will be able to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation/clean-up operations. ● The EnCoW will also ensure any disturbance licenses are arranged if any significant findings are determined from confirmatory pre-construction surveys. ● The EnCoW will advise on implementation of appropriate mitigation measures, including scheduling of works, and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised.
10.2	Construction	Monitoring of Mitigation Measures: ● During construction, monitoring will be carried out, and reported by the EnCoW, with regard for relevant conditions and licenses where required. ● Monitoring is necessary in close proximity to known bat roost features noted in Sections 10.4.5.1 and 10.4.5.5 and at badger setts found in Section 10.4.4.6 in Chapter 10 of the EIAR. ● The specific intervals at which the monitoring will take place will be determined by the relevant ecologist, having regard for licenses, and planning conditions.
10.3	Construction	Pre-Construction Confirmatory Surveys:

Discipline	Phase	Mitigation and Monitoring
		● In advance of any enabling works, the EnCoW will commission pre-construction, confirmatory surveys of identified significant ecological receptors, to update the findings of the surveys outlined in Section 10.4 in Chapter 10 of the EIAR. Such surveys will specifically confirm and update presence, distribution etc. of such receptors. These will then be used to inform any revisions to proposed mitigation plans. The exact nature and number of pre-construction confirmatory surveys will depend on the time that has elapsed between when the original surveys were undertaken and works on the proposed development start. As a minimum, the following will be needed ahead of any works. – Otter holts and couches within 150m; – Badger setts within 150m; – Potential bat roosts within 420m of the development; and – Invasive species within the proposed development site. ● Should a longer period (+> 12 months) elapse between last survey and the start of works, other pre-construction surveys might also be needed, such as: – Demarcated Local Importance (Higher value) habitats and works areas to minimise impacts and monitor works; – Breeding birds within 253m; and – Wintering Birds within 253m. ● The EnCoW will ensure that confirmatory surveys on habitats of Local Importance (Higher value) or higher are caried out in accordance with 'Best Practice Guidance for Habitat Survey and Mapping'. ● The confirmatory otter surveys will be carried out having regard to guidance of the National Roads Authority (NRA). The locations of otter couches noted within the Baseline Ecology report along with areas identified as suitable for otter holting will be thoroughly surveyed. Signs of otter including individual otters, holts, couches/resting sites, spraints and gland secretions, footprints and paths and slides will be recorded. ● The confirmatory badger surveys will be carried out having regard to Surveying Badgers and record signs of badgers including tracks, hair, latrines and setts within the Annex I Broadleaf forestry north of the Moneypoint Generating Station south of the N67 where potentially active badger setts have been identified. The area north of the N67 which includes the ASA and surrounding grass and woody habitats is also to be included within the survey area. The extent of survey area for badger surveys will be defined with regard to Guidelines for the Treatment of Badgers during the Construction of National Road Schemes as 150m beyond all works areas within suitable habitat. ● All surveys will be undertaken by a suitably qualified ecologist(s) will be carried out by an ecologist, but who will have demonstrable experience in the survey and assessment of the feature. The results of pre-construction confirmatory surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping. ● Survey reporting and mapping will also be provided to the Employer's Representative team.
10.4	Construction	● Mitigation for the Compensation and Retention of Habitats: ● Scrub (WS1): – For the permanent loss of 0.1 hectare of habitat within the Moneypoint Generating Station site, clearance of scrub will be kept to the minimum required to facilitate works with only areas of scrub within the redline boundary permitted to be removed. – For the potential disturbance or temporary loss of up to 1.5 hectares of habitat within the ASA, clearance within scrub habitat will be kept to the minimum required to facilitate ash and FDG by-product storage.

Discipline	Phase	Mitigation and Monitoring
		● Broadleaf Woodland (WD1): – For the potential disturbance or temporary loss of up to 0.4 hectares of habitat within the ASA, clearance within woodland habitat will be kept to the minimum required to facilitate ash and FGD by-product storage.
10.5	Construction	Mitigation for the Compensation and Retention of Habitats: ● Habitat Establishment/ Recreation: – On completion of each landfill cell within the ASA, the cell will be capped using an optimised stabilised FGD by-product mixture. It is proposed to increase the thickness of the FGD/Ash capping layer from 0.6 m up to a maximum of 1.6 m in order to store all the FGD by-product produced during the years 2025 to 2029. As was previously permitted, once complete the final profile will resemble a dome-like shape and will be finished with a layer of topsoil and seeded with meadow grass mix of native provenance. – If and where possible, all grassland habitats and (recolonising) bare ground habitats located within the ASA will be reseeded using local seed mixes, where possible, under the supervision and direction of the EnCoW. Plant species of native provenance will be used in all replanting of semi-natural habitats. It is preferable, and from a pure ecology and pollinator perspective, that no reseeding takes place and that the natural seedbank existent within the originally removed and then reinstated topsoil, is allowed to regrow. An appropriate mowing regime will be established to allow for the maintenance of these grassland habitats.
10.5	Construction	Construction Lighting: ● All temporary lighting associated with construction works will be placed strategically by the appointed EnCoW such that illumination beyond the works area is controlled, with light spill eliminated from areas surrounding important resting and foraging habitats such as the shoreline, woody habitats and the disused building identified as having moderate bar roost potential in Section 10.4.5.5 in Chapter 10 of the EIAR. Lighting will be cowled and directional to reduce significant light splay. Column height of lights will be carefully considered to minimise light spill, less than 8m where possible[183].
10.6	Construction	Construction Noise: ● Noise will be sustained over a temporary period, particularly from piling works (if needed) and this has the potential to impact species in the woodland to the north of the site. A noise barrier will, therefore, need to be erected around piling works and/or between the development site and the woodland to the north for the duration of piling works or other particularly noisy operations. ● It is noted that the development of the project design and construction methodology may result in a changes in the mitigation requirements for noise in order to comply with the relevant criteria. The assessment of noise impacts on the KER will be updated during the detailed design stage and the corresponding mitigation requirements will be confirmed based on latest and best available information.
10.7	Construction	Delineation of Works Areas: ● Prior to the works commencing, all works area will be demarcated with construction fencing. No construction works will occur outside of the delineated areas.
10.8	Construction	Stockpiling Material: ● All excavated material will be stored a minimum of 50m from the Shannon estuary and any drainage ditches hydrologically connected to the watercourse.

[183] BCIrelandGuidelines_Lighting.pdf (batconservationireland.org)

Discipline	Phase	Mitigation and Monitoring
		● Silt fences, or gravel drains, will be positioned around stockpiles to capture surface water runoff. The silt fences and gravel drains will be regularly inspected and maintained. ● The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Visual monitoring of the silt fence will be undertaken regularly and after significant rain. Silt fences will be repaired, replaced or reinforced as necessary to prevent migration of silt. ● Stockpiled material, comprising soil, earth, stone etc., will be covered in order to prevent surface water runoff. ● Sediment control in the construction stage is important to ensure that only high quality, treated runoff leaves the site. Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments will be provided for on-site if required during the construction stage. Erosion control measures include: – Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction; and – Monitoring of the weather forecast prior to planning excavation works. ● Other drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided adjacent to excavations and installed before starting site clearance and earthworks if deemed necessary by the supervising Engineer.
10.9	Construction	Concrete: ● The pouring of concrete will be required for foundation works associated with the new fuel tanks and auxiliary boilers. ● To prevent the runoff of concrete, the following measures will be implemented: ● If onsite concrete batching is required, this will need to take place in controlled, bunded area. Dust suppression will be required, and all materials needed for concrete production stored undercover from rain and/or within the bunded area to prevent runoff. Noise suppression techniques will be utilised at the batching plant and/or the plant will be placed within the required noise barrier. ● Quick setting concrete mixes will be used, where possible, to reduce the risk of contaminated runoff to nearby watercourses or the Shannon estuary. ● Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite. Any concrete wash water will be retained temporarily on site and prevented from entering the drainage network. The temporary storage will be in place until the management of the wash water (either treatment or disposal) is agreed with the appropriate agency and in accordance with the best practice and the CEMP. ● It will be ensured that covers are available for freshly poured concrete and these will be used to avoid wash off in the event of rain. ● As it will not be possible to cover the whole HFO bund floor while the concrete is drying, work will have to be undertaken only in a suitable weather window. It should also be noted that the HFO bund is a basin and as long as the shut off valve is closed, there is no possibility of any runoff. Attention will be paid to ensure that the shut off valve is closed during concreting operations. Existing IE Licence Emission Limit Values (ELVs) for all drainage from the site, including for pH on that line (SW2) will be complied with throughout the construction and operational phases. ● Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal. ● Concrete works will be scheduled during dry weather conditions whenever possible to reduce the elevated risk of runoff.
10.10	Construction	Hydrocarbons: ● Where mobile equipment is required, e.g., generators, these will be housed in a suitably sized bund/'plant nappy' such that any leaks/spills are intercepted. All mobile equipment used at the proposed stormwater outfall will be stored within a 'plant nappy'.

Discipline	Phase	Mitigation and Monitoring
		● Any chemicals and/or hydrocarbons required on site during the construction phase will be stored in designated, impermeable areas and be bunded or double skinned. ● Fuelling and lubrication of plant and equipment will be carried out on impermeable surfaces or using mobile drip trays and will be restricted to the construction site compound only. No refuelling will be permitted to occur within 50m of the estuary or drainage ditches. ● All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Acts 1996, as amended. ● Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment and in when it should be deployed. ● Welfare/hygiene facilities will be located within the construction compound and contractor village, a minimum of 50m from any watercourse/drainage ditch. ● All water from wheel washes will be captured and removed from site and disposed of in line with Waste Legislation. No water will be discharged into any watercourses or drainage ditches.
10.11	Construction	Mitigation for the protection of Otter: ● Should the confirmatory survey result in the requirement for any exclusion zones, these will be established and subsequently monitored by the EnCoW for compliance. ● Should holts be identified within 150m of the proposed development the following will, at a minimum, be employed, unless otherwise agreed with the NPWS: – No works will be undertaken within 150m of holts where breeding females or cubs are present. – Works within 150m of such a holt can only take place following consultation and in agreement with the NPWS. – No wheeled or tracked vehicles of any kind will be used within 20m of active but non-breeding holts. – No light work, such as digging by hand or scrub clearance will take place within 15m of such holts, except under license from NPWS. – Identified exclusion zones will be fenced and clearly marked on site prior to any invasive works. – All contractors on site will be made fully aware or the procedures in relation to the holts by the EnCoW.
10.12	Construction	Mitigation for the Protection of Badger: ● As outlined previously, and prior to works commencing, a preconstruction survey for badgers will be undertaken. Where active badger setts have been identified within the Zone of Influence (ZoI) of the proposed development, the use of camera monitoring, setting of footprint traps, soft blocking of the sett entrance or similar will be required to confirm their presence. ● A description of the setts, i.e., main sett, annex sett, or outlier sett will be provided along with the level of activity at each. This will allow for an understanding of the importance of the setts in the wider context of the local population. ● As per the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes, where setts have been confirmed, no heavy machinery will be used within 30m (unless carried out under licence from the NPWS). Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance, and light work, such as digging by hand or scrub clearance, will not take place within 10m of sett entrances.

Discipline	Phase	Mitigation and Monitoring
		● None of the above works will be undertaken within 50m of active setts during the breeding season (December to June inclusive). An assumption that the sett is active will apply unless proven otherwise during the course of investigation. Where works may interfere with the badger sett directly, exclusion will take place as per NRA guidelines. ● All identified exclusion zones, as outlined above, will be clearly marked out on site and communicated to all site staff prior to works commencing.
10.13	Construction	Mitigation for the Protection of Bats: ● The design and construction of bat mitigation measures has had regard to relevant documents, including: the NRA's Guidelines for the Treatment of Bats During the Construction of National Road Scheme, the NPWS Bat Mitigation Guidelines for Ireland , and (with specific regard to roosts in trees), the Bat Tree Habitat Key . ● Two bat roost features have been identified as likely to be disturbed by the proposed development. Construction and operational lighting will be sympathetically considered and operational lighting at night will be via automatic sensors and will only activate when needed, focussing on buildings, away from natural areas. ● Any trees that may require felling will be examined for presence / absence of bats or bat roosts immediately prior to felling and any features in trees, identified from ground level as of medium or high suitability, will be climbed and/or accessed by a Mobile Elevated Working Platform. They will be inspected using a digital endoscope to confirm the ground-level rating, and where possible identify presence / absence of roosting bats. Where timing facilitates it (i.e., when felling is being undertaken during the active season for bats from May to September inclusive), emergence surveys may additionally be carried out to confirm presence / absence of roosting bats, subject to the advice of the bat ecologist, and any licence conditions. Where felling does not occur within one day of the examination, trees will need to be re-assessed, unless otherwise agreed with the NPWS.
10.14	Construction	Mitigation for the protection of other mammals protected under the Wildlife Act: ● Implementation of mitigation for breeding birds, is outlined in Measure 10.15, This same mitigation will simultaneously provide protection for pygmy shrew and hedgehog, as the majority of their main breeding seasons run from April-October. Stoat, that breed in May-June (Hayden and Harrington, 2001) will also be covered by the same measure, as will hare, as although they have been recorded breeding in every month, spring to summer is thought to be the peak period.
10.15	Construction	Mitigation for the Protection of Breeding Birds: ● In accordance with Section 40 of the Wildlife Acts, the removal of vegetation which may be used as nesting sites by breeding birds, will be cleared outside of the birds nesting season (1st March to 31st August inclusive). ● Should clearance be required during the bird breeding season, a suitably qualified ecologist will conduct pre-construction surveys to assess risk of disturbance to nesting birds to inform vegetation clearance activity. In the event that pre-construction confirmatory surveys confirm or presume nesting birds are present, an exclusion zone will be established around the nesting bird (to include the risk of abandonment due to indirect disturbance). Within these exclusion zones, no vegetation clearance may proceed until young are fledged, or nesting has failed. Repeat surveys will be required if vegetation has not been cleared within 72 hours of the survey taking place.
10.16	Construction	Mitigation for Breeding Birds and Wintering Wildfowl: Breeding birds and Wintering wildfowl have been recorded within the proposed development boundary (on land, mostly around the ASA) and within the 253m ZoI set for disturbance effects. The following mitigation will be implemented to ameliorate noise and visual disturbance effects. ● Noise maybe sustained over a temporary period, particularly from piling works (if needed) and this may impact wintering wildfowl on site. It is therefore recommended that a temporary noise barrier be erected around piling works and/or between the development site and the ASA.

Discipline	Phase	Mitigation and Monitoring
		● Ongoing monitoring of the barrier will be undertaken to ensure it is installed correctly and identify any defects for the contractor to remedy. ● All plant shall be operated and maintained in accordance with the manufacturer's recommendations, including use and maintenance of the specific noise reduction measures, such as: – The use of mufflers on pneumatic tools; – Effective exhaust silencers; – Sound reducing enclosures; and – Machines in intermittent use shall be shut down during periods where they are not required. ● Noise modelling that has been conducted to assess likely noise levels during operation have determined that noise levels will be below 55dB and, therefore, will have negligible effects on species. No additional mitigation is therefore proposed during the operational phase.
10.17	Construction	Invasive Species Control Measures: No Third Schedule Invasive Species were identified within the ZoI proposed development, although, there is potential for invasive species to have become established within or adjacent to the works areas following baseline surveys, and before construction. As a result: ● Prior to works commencing, a full invasive species survey will be carried out. The pre-construction invasive species survey will be carried out within the works areas, including compound locations and laydown areas, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas. ● The invasive species survey will be carried out during the appropriate growing season (May – October). The findings of this invasive species survey will be incorporated into the measures below, by the Contractor's EnCoW and any specialists. ● Any stands of invasive species recorded within the ZoI will be clearly marked out as restricted areas. Such exclusion zones will incorporate a 4m buffer, appropriate to the species found, such that below ground growth is accounted for (4m for Japanese knotweed, buffer not required for other species). No works will be carried out within the exclusion zones unless approved by the EnCoW. ● The EnCoW will carry out a toolbox talk for all construction personnel. This will provide information on how to identify and manage invasive species and will take place prior to works commencing in any areas where Invasive Species have been recorded. ● All machinery will be steam-cleaned prior to entering and before leaving site.
10.18	Operational	Operational Lighting: ● Lighting will be cowled and directional to reduce significant light splay. Column height of lights will be carefully considered to minimise light spill, avoiding areas surrounding important resting and foraging habitats such as the shoreline, woody habitats and the disused building identified as having moderate bat roost potential in Section 10.4.4.6 in Chapter 10 of the EIAR. Lighting at night will be via automatic sensors and will only activate when needed, focussing on buildings, away from natural areas including the Shannon estuary, shoreline habitats, woody habitats that act as important foraging, commuting and resting areas and confirmed bat roosts, badger setts and otter couches.
10.19	Operational	Operational Noise: ● During operations, and based on noise modelling that has been conducted, noise levels will be below 55dB and will, therefore, have negligible effects on species. No additional mitigation is proposed during the operational phase.

Discipline	Phase	Mitigation and Monitoring
10.20	Operational	Operational discharge of process water: ● Process water discharged from the proposed auxiliary boiler house will connect to the existing system that discharges to the Shannon Estuary at IEL emission point SW2. Outputs from this process water discharge will be limited such that the overall discharge will not exceed the existing IEL flow limits of 25m^3/hour or 400m^3/day. In addition to this, current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2, such as pH, mineral oil, suspended solids, and ammonia (as N), will continue to be complied with.
10.21	Operational	Measures to prevent and control an oil spill from the tankers: ● During the transit of the HFO vessels within the Lower River Shannon Estuary ESB will ensure that all oil tankers shipping the HFO will have regard the International Safety Guide for Oil Tankers and Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS). In addition, the recommendations of the International Maritime Organisation will be reviewed and implemented, as necessary.
10.22	Operational	Measures in place in the event of a spill in the Shannon Estuary: The section also sets out measures to be instigated in the event of an accidental oil spill during operations. These measures and procedures will continue to be implemented during the operational phase of the proposed development. ESB are also in the process of reviewing the following in consultation with Shannon Estuary Anti-Pollution Team (SEA-PT): ● HFO delivery / unloading procedures; ● Stockpile of spill / emergency response equipment, including oil booms; and ● Emergency / spill response procedures and agreements. ESB are committed to providing the necessary equipment to satisfy SEA-PT and update procedures as required in advance of the filling of the proposed new HFO tanks.
10.23	Operational	ESB Moneypoint Oil Spill Response Plan within the site: Moneypoint has an Oil Spill Response plan in place which is executed in the event of a spill of oil. In the event of an oil spill within the Moneypoint site, the immediate assessment and actions by the Operations Team Leader or Designated Team Member are illustrated in Figure 10.4 in Chapter 10 of the EIAR. The plan contains measures to be implemented in the event of an oil spill, including: ● Discovery and notification of the appropriate personnel; and ● Identification of a Tier 1, 2 or 3 incident: – Tier 1: a Tier 1 incident is one in which a small spill can be dealt with by personnel in the immediate vicinity and that has no external impact. Each installation / works area in the area of the plan has enough equipment to respond to a Tier 1 incident. In the event of a Tier 1 being activated, the spiller or installation personnel will respond in accordance with their local procedures and the Duty Harbour Master will monitor the response. – Tier 2: a Tier 2 incident is one that will require the combined resources of the organisations represented on the SEA-PT team. It will also require the involvement of regulatory bodies, local authorities, advisors and advisory bodies. In general, all spills in the Shannon Estuary, other than minor ones, will require a Tier 2 response. A Tier 2 response will require the activation of Shannon Foynes Port Company (SFPC) Incident Management Team and the SEA-PT. This will instigate notifications to the Coast Guard and Local Authorities and Tier 2 response specialists.

Discipline	Phase	Mitigation and Monitoring
		– Tier 3: a Tier 3 incident is a major oil pollution event with potential for environmental, social and economic impacts that are beyond the capability of local resources. It will require local, national and probably international resources. A Tier 3 response is initiated by contacting the Coast Guard. A response at this level will be coordinated under the National Contingency Plan and within the Management of Major Emergencies Framework. ● Incident notification and response process is detailed. ● Tier escalation matrix is provided. ● An Incident Response and an Incident Action Plan are in place. ● ESB has a supply of oil booms available, and this is also a requirement for the IE licence. It should also be noted that the last remaining operational HFO fired electricity generating unit at Tarbert Generating station (TB3), located across the estuary at Tarbert, Co. Kerry and operated by SSE Airtricity, officially closed in December 2023. Units TB1, TB2 and TB4 ceased normal operation during 2021 and officially closed in December 2023 (source: Pg 37 & 80 of EirGrid SONI GCS 2023-2032). It is estimated that around 540,000 Tonnes HFO per year would have been consumed at Tarbert when the plant was fully operational as a mid-merit plant. This would equate to ca.14 HFO ship deliveries at 40,000 tonnes each. A representative of Tarbert confirmed that HFO deliveries to the site, when it was fully operational, averaged ca.12 to 14 per year and that ships of 35,000-40,000 tonnes were the more common ship sizes. These HFO deliveries in the estuary to Tarbert have, therefore, have now ceased with no proposal for them to recommence in the short to medium term, reducing the traffic of HFO tanker ships in the estuary. ● Major environmental damage can be controlled and prevented by prompt isolation and containment of an oil spill – isolating local drains using absorbent booms, securing the area against traffic, containing the spill and monitoring oil interceptor outlets to detect oil spill to the Shannon. ● ESB carry out regular emergency preparedness exercises are conducted to ensure all staff are aware of measures to be implemented during emergency events.
10.24	Operational	Measures in place for HFO unloading: The following measures are in place and will continue to be implemented during HFO oil unloading: ● Oil unloading arm and valves on the jetty are manned at all times. ● The full length of the HFO fuel line is inspected periodically (current frequency every 2 hours) ● Pressure and temperature is constantly checked and recorded ● Radio contact is maintained with the ship, the control room and persons involved in the procedure ● The oil sump located underneath the jetty is emptied prior to arrival of the oil ship ● Security is maintained on the jetty while unloading ● Firefighting equipment is positioned in place prior to arrival of the oil ship ● Oil spill containment equipment is located on the jetty ● Oil dry is positioned on the jetty (currently 2 tonne minimum) ● Jetty Oil Unloading Arm Area and HFO tank head space designated as ATEX Areas ● Hot work and smoking is prevented while unloading is taking place ● The pipework and valves are maintained as per Oil Tank & Pipework Technical Standard

Discipline	Phase	Mitigation and Monitoring
10.25	Operational	Measures to prevent and address an oil spill from the HFO tanks on site: ● All storage tanks, containers and drum storage areas that contain HFO will have leak containment bunds and leak detection systems in place. ● All chemicals stored on the site will be regulated under the IE licence. All fuels and chemical stored on site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH. ● In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities. Following the accidental release of HFO within the existing HFO bund on 05 May 2021 (see Section 12.4.2.1 of Chapter 12 of the EIAR), additional measures are now in place. A quantitative risk assessment was also conducted and found that the risk of HFO migrating laterally through groundwater and beyond the site boundary impacting the Shannon Estuary was very low and likewise for migrating along the impacted drain. The following measures have been implemented as a result of this accidental release: ● All shifts were briefed as to the significance of this incident and the potential damage which could have been caused to the station. ● All tanks in the oil farm have alarmed level indicators fitted. ● The signage in the oil farm was brought up to standard. ● The SOPs (Standard Operating Procedures) were reviewed.
10.26	Operational	Invasive Species Control Measures: Ships carrying HFO to Moneypoint shall adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM). In order to minimise the transfer of invasive marine aquatic species, it is recommended that the 2023 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (Resolution MEPC.378 (80), adopted on 7 July 2023) are followed, including the following measures: ● An Anti-Fouling System (AFS) will be installed and maintained. ● Reinstalling, reapplying or repairing the AFS will be regularly undertaken in accordance with manufacturer's guidance and include measures for surface preparation to facilitate good adhesion and durability. ● A ship-specific contingency action plan, based on specific triggers from monitoring of biofouling parameters, will be described in the Biofouling Management Plan (BFMP). ● The contingency action plan will include: – proactive actions that can be implemented to lower the risk of biofouling accumulation if a higher biofouling risk may be predicted owing to planned operational changes – corrective actions to an operating profile, maintenance or other repair plans, if monitoring identifies an early indication of elevated risk. – occasional inspection to determine biofouling accumulation and if the monitoring of biofouling parameters identifies an indication of prolonged elevated risk. ● The ship-specific BFMP will include, but not necessarily be limited to, the following:

Discipline	Phase	Mitigation and Monitoring
		– identification of the officer, or the position (e.g. chief engineer), responsible for the BFMP, ensuring that the plan is properly implemented – details of the AFS installed and where it is installed – details of the recommended operating conditions suitable for the selected AFS to avoid deterioration of AFS, including recommended conditions such as temperature, salinity, speed – details of expected AFS efficacy throughout AFS lifetime including the need for inspection or maintenance, if relevant – description of monitoring on biofouling risk parameters – regime for cleaning, if any – details of hull and niche areas where biofouling may accumulate – schedule for fixed inspections of areas – procedures for reactive cleaning actions that will be performed if triggered by inspection results – contingency action plan based on specific triggers from monitoring of biofouling risk parameters – regime for repairs, maintenance and renewal of AFS, when relevant, in accordance with the manufacturer's instructions – process for monitoring and maintenance of MGPS as per the manufacturer's instructions to ensure their effectiveness in minimizing biofouling – details of the documentation/reports required to document biofouling activities.
Chapter 11 Surface Water Resources and Flooding		
11.1	Construction	An Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
11.2	Construction	Construction activities will be managed to prevent impacts to surface waters: ● Concrete wash water will be retained temporarily on site and prevented from entering the drainage network. The temporary storage will be in place until the management of the wash water (either treatment or disposal) is agreed, in accordance with the best practice and the CEMP. ● Refuelling will be undertaken using purpose designed equipment bunded to prevent leaks. Should any fuels or other liquids spill or leak from any vehicles these will be cleaned immediately, and any affected soils excavated and removed. ● Excavations for service runs will be managed using control measures such as bunding areas to prevent surface runoff and protecting drains.
11.3	Construction	All construction works will be carried out in accordance with the CEMP which defines the measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water drainage system.
11.4	Construction	Wet concrete operations adjacent to watercourses will be avoided where possible.
11.5	Construction	Wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite, and remote from watercourses.
11.6	Construction	Where works on other projects in vicinity of proposed development occur in parallel appropriate mitigation measures, within the parameters assessed in this EIAR (including the scheduling of works and regular liaison meetings between project teams) will be implemented to ensure that plans are co-ordinated, and impacts are minimised.
11.7	Construction	All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for ‘Environmental Good Practice on Site’ (C741) and ‘Control of water pollution from linear construction projects Technical guidance’ (C648) and the IEL.

Discipline	Phase	Mitigation and Monitoring
11.8	Construction	In order to reduce the risk of contamination arising as a result of spills or leakages on land, measures including, but not limited to, the following will be employed. ● All collected waste will be managed in accordance with the Waste Management Act 1996, and associated Regulations. ● In accordance with Condition 8.4 of the IEL, waste and materials shall be stored in designated areas, protected as may be appropriate against spillage and leachate run-off. The waste and materials shall be clearly labelled and appropriately segregated. ● Refuelling of plant, equipment and vehicles will be carried out on impermeable surfaces or using mobile drip trays where it's not possible to provide an impermeable surface. ● All tanks and drums will be bunded in accordance with established best practice guidelines. ● Spill kits will be provided at all compound locations and carried by all crews during excavation works.
11.9	Construction	Sediment control in the construction stage is important to ensure that only high quality, treated runoff leaves the site. Erosion control measures to prevent runoff flowing across exposed or excavated ground and becoming polluted with sediments will be provided for on-site if required during the construction stage. Erosion control measures include: ● Minimising the area of exposed ground and ensuring excavation will not proceed faster than the rate of construction. ● Monitoring of the weather forecast prior to planning excavation works.
11.10	Construction	Other drainage runoff controls such as settlement tanks, silt fences and silt traps will be temporarily provided adjacent to excavations and installed before starting site clearance and earthworks if deemed necessary by the supervising Engineer.
11.11	Operational	The proposed development will operate in accordance with the limits for wastewater discharge set by the EPA under the IE licencing regime.
11.12	Operational	The existing water quality monitoring programme will continue and the parameters, thresholds and frequency, as set by the EPA, will be complied with.
11.13	Operational	In the event of an accidental oil spill, the ESB Moneypoint Oil Spill Response Plan will be implemented which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills. The measures to prevent and mitigate oil spill during unloading in the estuary are discussed in Section 10.8 in Chapter 10 of the EIAR.
11.14	Operational	During the transit of the HFO vessels within the Lower River Shannon Estuary ESB will ensure that all oil tankers shipping the HFO will have regard the International Safety Guide for Oil Tankers and Terminals (ISGOTT 6) produced by Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS). In addition, the recommendations of the International Maritime Organisation will be reviewed and implemented, as necessary.
11.15	Operational	Further recommendations regarding the ensuring of surface water protection on site and of the Lower River Shannon SAC during the construction and operational phases of the proposed development include the following: ● Avoid the interruption and diversion of natural water flow paths; ● Monitor any changes to the thermal environment of the River Shannon and fish entrainment; ● Avoid the pollution of water which enters the construction phase and operational drainage systems, including through the maintenance of any settlement ponds and monitoring of silt traps; and

Discipline	Phase	Mitigation and Monitoring
		• Continually monitor the impact on watercourses within the site and rectify any damage to the aquatic environment with the appropriate authorities.
Chapter 12 Land, Soils and Hydrogeology		
12.1	Construction	As detailed within the CEMP (Appendix C of this EIAR), the Environmental Clerks of Works (EnCoW) will be responsible for identifying any ground contamination during the construction phase. Surveys for visual or olfactory evidence of contamination will take place regularly during excavations and works will be stopped for further investigation if any evidence is encountered.
12.2	Construction	Any contaminated soils, sediment or groundwater that is encountered will be managed in accordance with best practice guidelines. Any contamination discovered during the construction will be assessed using a Contaminated Land Risk Assessment (CLRA). Where a significant risk to human health or controlled waters is identified the contamination will be remediated on-site or excavated, appropriately classified and disposed of as waste. Contamination management will comply with all relevant legislation and be undertaken in consultation with the EPA and any other relevant authorities as outlined in the CEMP in Appendix C.
12.3	Construction	Asbestos Containing Material (ACM) will, if identified, be stored separately from other contaminated material to prevent mixing of asbestos with other contaminated materials.
12.4	Construction	Storage of contaminated material, if encountered on-site, will be avoided where possible. If storage on site is necessary, contaminated material will be strictly segregated into designated bunded areas where contaminants cannot leach into the underlying ground.
12.5	Construction	If uncontaminated material is to be stored on site, consultation with the EPA will be undertaken prior to commencing storage, to ensure that any relevant authorisations are obtained and that spoil is managed, at all times, in accordance with all relevant legislation.
12.6	Construction	During construction the contractor will implement an environmental management plan which will set out control measures and procedures to ensure potentially polluting activities are controlled and managed. These measures will include, but are not limited to, the following: • Fuel storage – bunded tanks to prevent spillages and designated fuelling areas with spillage control. • Chemical storage – all potentially polluting chemicals will be stored in secure weatherproof enclosures with spill kits. • Concrete washout will be established. • Should dewatering be required any discharges will be treated to remove contaminants and silt and disposed of in accordance with EPA requirements. • The site will be kept secure to prevent vandalism which can lead to pollution from stored liquids. • Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations. • The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Visual monitoring of the silt fence will be undertaken regularly and after significant rain. Silt fences will be repaired, replaced or reinforced as necessary to prevent migration of silt.
12.7	Construction	The CEMP will include emergency procedures to prevent adverse impacts in the event of a pollution event arising from accidents and disasters.
12.8	Construction	Routine monitoring of the site to ensure potentially contaminating activities remain under control. Monitoring will include daily visual monitoring of any surface water outfalls.

Discipline	Phase	Mitigation and Monitoring
12.9	Construction	Prior to commencement of the development, the appointed Contractor will implement a construction Resource and Waste Management Plan (included as part of the CEMP) in accordance with the Best Practice Guidelines for the preparation of resource and waste management plans for construction and demolition projects (EPA, 2021). This will ensure that optimum levels of waste prevention, reduction, reuse, recycling and recovery are achieved throughout the duration of the proposed development. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery / disposal in a manner which will not adversely affect the environment. Wastewater will be disposed offsite in accordance with the Waste Management Act 1996, and associated regulations, in agreement with the EPA.
12.10	Construction	Prior to any works taking place ESB will undertake an inspection to identify the presence of all hazardous materials used in the construction of the rising conveyor and the stacker reclaimers structures and within the plant. Such materials can include; asbestos, refractory ceramic fibres, ozone depleting foams, Polychlorinated Biphenyls (PCBs) in transformer oils, etc. Where possible these will be removed prior to dismantling, however it is anticipated that there will be no hazardous insulating materials in the plant and structures to be demolished, as part of the dismantling works. The use of specialist contractors and the production of task specific method statements in line with relevant legislation and best practice will be implemented as per the CEMP (Appendix C) and the RWMP (Appendix C.1). Any unexpected ground contamination identified during the proposed works will be the subject of a remediation strategy which may entail additional monitoring.
12.11	Operational	Connecting process water from the proposed auxiliary boiler house to the existing system which discharges to the Shannon Estuary at IE Licence emission point SW2. This process water discharge will be limited such that the overall discharge will not exceed the existing IE Licence flow limits of 25m^3/hour or 400m^3/day. In addition to this, the current monitoring requirements and emission limit values (ELVs) associated with discharge at SW2 will continue to be complied with (pH, mineral oil, suspended solids, and ammonia (as N)).
12.12	Operational	In the event of a fire at one of the HFO tanks, the affected bund can provide firewater retention. The shut-off valves on the bund drainage system will be set to closed by default. Discharge of contaminated firewater from the HFO tank farm will therefore be shut off and any water in the bund would be required to be characterised (including analysis) to determine the options for proper disposal in accordance with the condition of the IE licence and in agreement with the EPA and other relevant authorities.
12.13	Operational	It is also recommended that settlement ponds within the RLB are maintained during the operational phase to allow for the adequate settlement of suspended solids and sediments and prevent any deleterious matter from discharging (Inland Fisheries Ireland, 2023). Silt traps will be designed to minimise the movement of silt during intense precipitation events where the trap may become hydraulically overloaded.
12.14	Operational	In the event of an accidental oil spill, the ESB Moneypoint Oil Spill Response Plan will be implemented which contains measures and checks to ensure compliance with the conditions of the IE licence including the prevention and response to spills.
12.15	Operational	Under the terms of Schedule C.6 of the site's IEL, groundwater monitoring is required from an agreed number of existing monitoring wells across the site, plus any boreholes as may be determined under the Landfill Operational Plans. Quarterly monitoring of the wells listed above is required under the licence, with some parameters to be analysed/measured on a quarterly basis and others to be analysed on a biannual basis. Operational works will not interrupt quarterly groundwater monitoring.
12.16	Operational	A network of gullies, aco channels (or similar) and surface water pipelines will be required to convey stormwater to the south of each bund. As with the existing surface water drainage system, discharge of the proposed surface water from the bund areas will be controlled by a manually operated valve. The valve will, as is currently the case, be set to closed position and only opened following inspection in accordance with the IEL conditions to drain each bund. Operations will continue to comply with the IE licence.

Discipline	Phase	Mitigation and Monitoring
12.17	Operational	If dewatering is required and the daily abstraction volume exceeds 25m^3, a dewatering / discharge permit will be obtained with specific mitigation measures relevant for the works. Abstracted groundwater will be continuously monitored. Any contaminated groundwater will be treated to a suitable quality for discharge to surface water or tankered off site.
Chapter 13 Architecture, Archaeology and Cultural Heritage		
13.1	Construction	Although no excavations are proposed within the ASA, should this occur, a suitably qualified archaeological consultant will monitor groundworks under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage, in the event that excavation areas are deeper than the earliest ash deposits at the Ash Storage Area. Should any archaeological material be encountered, works will cease, and the County Archaeologist and National Monuments Service shall be notified. A strategy will be proposed to the County Archaeologist and National Monuments Service to suitably record any archaeological material identified, and preserve any archaeological material in situ, where possible. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of archaeological excavation will be proposed, to ensure the preservation by record of the area of the development that will be directly impacted upon. Further work will then only be carried out following consultations with the County Archaeologist and the National Monuments Service.
Chapter 15 Traffic and Transport		
15.1	Construction	The temporary effects of construction, regardless of the assessed level of significance, will be mitigated through adoption of a regulated and approved Traffic Management Plan (TMP). The general purpose of a TMP is optimise the efficiency and safety of all traffic activities generated by the proposed development and thus maintain suitable amenity and safety for local communities and other roads users. Operational traffic associated with the proposed development will be similar to that of the existing development. Nonetheless, it is recognised as good practice to implement a Workplace Travel Plan (WTP) to promote sustainable transport use and discourage single vehicle occupancy travel.
Traffic Management Plan (TMP)		
15.2	Construction	The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Clare County Council, the appointed contractor, TII and/or their Agents and An Garda Síochána as appropriate. Construction activity generated vehicles (with the exception of site personnel in cars and vans) will travel on pre-defined routes to and from the relevant sites to reduce effects on existing local traffic.
15.3	Construction	During the construction phase, signage will be installed to warn road and recreational route users to the presence of the works access and the associated likely presence of large or slow-moving construction traffic.
15.4	Construction	Car sharing will be promoted to construction personnel by the contractor during the induction process.
15.5	Construction	In order to reduce the potential for mud and other debris being deposited onto the local road network in the vicinity of worksite accesses, wash down and washout of concrete transporting vehicles will not be permitted at the location of construction. Such wash down and washout activities will take place at a designated, contained, location on site or preferably at an appropriate facility offsite, and remote from watercourses. This will minimise the amount of deleterious material deposited on the road surface and the appointed contractor will ensure that the nearest public road will be kept clear of debris by monitoring and then utilising a road sweeper where necessary.
15.6	Construction	The appointed contractor could employ a number of sub-contractors, and all will fall under the umbrella of the TMP and will have an obligation to adhere to the Plan; this obligation will form part of the procurement process and will be written into any contract of employment.

Discipline	Phase	Mitigation and Monitoring
15.7	Construction	Compliance will be monitored by the Project Manager, on behalf of the appointed contractor, via spot checks to ensure that vehicles follow the measures set out in the TMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors. The appointed Contractor will nominate a person to be responsible for the co-ordination of all elements of traffic and transport, except community liaison during the construction process, a nominated Liaison Officer.
15.8	Construction	ESB will appoint a Community Liaison Contact. The Community Liaison Contact will be the direct point of contact for the developer organisation with the local community. Accordingly, local residents and business holders can contact the Community Liaison Contact for general information purposes or to discuss specific matters pertaining to traffic management or site operation. The Community Liaison Contact will regularly liaise with the nominated Liaison Officer.
15.9	Construction	If the construction phase of any notably sized development(s) appears likely to overlap with the proposed development, the appointed contractor will seek to liaise with the appropriate developer organisation regarding the scheduling of deliveries to identify potential means of reducing the effects of combined construction. Prior to commencement of construction, and during the construction phase, engagement with the proponents of other developments will continue and where there is potential for works to be carried out in parallel, appropriate mitigation measures will be implemented including the scheduling of works and regular liaison meetings between project teams to ensure that plans are co-ordinated and impacts on population and human health are minimised. The specific detail will be developed by the appointed contractor within the parameters assessed in this EIAR.
Workplace Travel Plan (WTP)		
15.10	Operational	This WTP Framework will be implemented with focus on employees associated with the operation of the proposed development. The WTP will be further developed with reference to national travel planning guidance including National Transport Authority's "Workplace Travel Plan – A Guide for Implementers" (2022). The aim of the WTP within the planning process is to contribute towards sustainable development by enabling sustainable travel opportunities to new developments; objectives will therefore be developed with these aims in mind. The following primary objectives have been identified: ● Maximise the use of sustainable transport modes of travel by employees on their journey to and from site; ● Minimise traffic impact of the proposed development through minimising car travel (particularly single occupancy car travel and travel during peak hours) of employees on their journey to and from the site; ● Contribute positively to the local environment through the implementation of sustainable transport initiatives; and ● Deliver an ongoing commitment to sustainable transport issues at the site, with comprehensive monitoring that leads to regular review of targets and measures. Key measures in the WTP include: ● Workplace travel plan surveys to monitor modal shift ● New starter information packs provided for all new employees including up to date travel information and advice on sustainable travel. ● Promotion of car sharing between employees. ● Public transport promotion

Discipline	Phase	Mitigation and Monitoring
		● Promotion of sustainable travel such as EV and e-bikes.
15.11	Operational	A Workplace Travel Plan (WTP) Framework will be implemented with focus on employees associated with the operation of the proposed development. The WTP will be further developed with reference to national travel planning guidance including National Transport Authority's "Workplace Travel Plan – A Guide for Implementers" (2022). A Travel Plan Co-ordinator (TPC) will be appointed to administer the implementation and ongoing monitoring of the Workplace Travel Plan. It is envisaged that the WTP will be developed and consolidated, as necessary, with any existing Workplace Travel Plan arrangements prior to the commencement of operation. Workplace travel associated with construction traffic (during the construction phase) will be covered in the TMP.
Chapter 16 Material Assets, including Waste		
16.1	Construction	Where feasible, materials would be delivered on a just-in-time basis to avoid damage or contamination that would lead to waste generation.
		All suitable excavated material would be reused in the construction of the proposed development, wherever feasible. This aims to reduce the requirement to import materials for construction and to reduce the need to remove surplus materials from site. It is envisaged studies to be carried out to determine the suitability of materials to be reused within the proposed development. Stones from the HFO bund are likely to be not contaminated and, therefore, are anticipated to be reused within the proposed development. The envisaged studies include: ● A Generic Quantitative Risk Assessment that will assess the risk to onsite and offsite environmental and human health receptors ● A soil/material waste classification report looking at the material around the HFO tanks and elsewhere within the red line boundary that is to be removed and classifying this material ● A material reuse plan to look at the fill material around the HFO tanks and adjudge its suitability to be used as fill material during the construction works
16.2	Construction	Where site-won material is not available or suitable for reuse, secondary or recycled materials would be procured, where available and feasible.
16.3	Construction	Temporary stockpiling of fill materials prior to incorporation in the proposed development would be avoided where possible, to ensure double handling and damage is minimised and therefore avoidance of waste. However, where required, materials would be stockpiled in accordance with best practice and managed appropriate to limit the likelihood of damage or contamination.
16.4	Construction	Pre-cast elements would be used, where technically feasible, to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.
16.5	Construction	The waste hierarchy and circular economy principles would be implemented throughout the construction phase to minimise disposal and maximise reuse and recycling of waste arisings. Mitigation measures for reuse and recycling of waste include (but are not limited to): ● Reusing excavated soils on site, where possible. ● Recycling of inert materials by crushing, blending and subsequent reuse, as an aggregate. ● Providing on site facilities to separate out waste to enable the recovery of material through recycling. ● Where waste must be taken to a recycling or disposal site, the contractor would ensure that the site has the appropriate permits. In addition, the suitable facility would be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The contractor would identify the closest and relevant treatment and disposal sites.

Discipline	Phase	Mitigation and Monitoring
		• Waste arisings sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery/disposal in accordance with the Waste Management Act 1996 and associated amendments and regulations and in a manner which will not adversely affect the environment. • All contaminated/hazardous waste (including soil) would be identified for proper management and transferred/disposed of to an adequate waste management facility. These materials will be stored separately to any non-hazardous material to avoid cross-contamination.
16.6	Construction	A non-exhaustive list of waste management facilities sites is provided in Table 16.10 in Chapter 16 of the EIAR. The ability for waste arisings to be deposited at these sites would be dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the proposed development that may be used.
16.7	Construction	Best practice would be to minimise the generation of waste as much as possible in accordance with the waste hierarchy principles and to incorporate circular economy principles, wherever it is technically appropriate and economically feasible. The use of the CEMP and Resource and Waste Management Plan (RWMP) would seek to implement these waste hierarchy and circular economy principles. Therefore, wherever technically appropriate and economically feasible, adequate mitigation measures will be applied to the proposed development and, therefore, the potential effects would be minimised. The CEMP and RWMP will be available for inspection at all reasonable times for examination by the Local Authority.
16.8	Operational	Waste arising during operational phase on site will be managed as per the conditions of the IE licence (P0605-04).
16.9	Operational	The waste hierarchy and circular economy principles would also be implemented throughout the operational phase of the proposed development. Mitigation measures for material assets and waste management include (but are not limited to): • Delivering material assets to a just-in-time basis to avoid storage and double handling that could lead to damage or contamination and, therefore, to minimise waste arisings. • Providing on site facilities to separate out waste streams to enable managing waste as high up in the waste hierarchy as feasible, prioritising the recovery and recycling of material over landfill disposal. In addition, provide clear signage and/or colour coded receptables in designated and easily accessible locations. • Handling, storing, managing, reusing or recycling waste arisings as close as practicable to the point of origin. • Managing and programming all operations programmes in such a manner as to prevent/minimise waste production. Circular economy principles to be incorporated where feasible. • Transporting of waste to off-site facilities to be carried out by authorised waste contractors, and transported to appropriate permitted waste management facilities, considering the Proximity Principle wherever feasible. • Ensuring all employees are aware of the best practices to optimise material assets use and minimise waste generation, including waste policies and procedures from ESB. • Ensuring clear and effective communications and signage about recycling, waste hierarchy and circular economy. • Establishing standard operations procedures that are aimed to minimising waste generation. • Producing an Operational Waste Management Strategy (OWMS) is recommended. A OWMS will help to estimate waste arisings, provide an adequate management strategy, outline opportunities to reduce waste arisings and details on a waste monitor process.

Discipline	Phase	Mitigation and Monitoring
		• To manage the ash generated higher up in the waste hierarchy, permission will be sought from the EPA to reclaim ash from the ASA to use for capping material. This process will be regulated by the IEL. Sections 3.6 and 4.2.5 of the EIAR provide further details on the recovering of ash from the ASA.
Chapter 17 Major Accidents and/or Disasters		
17.1	Construction	In the different stages of the project lifetime several best practice mitigation measures will be implemented, relevant to major accidents and disasters, as detailed through the CEMP to ensure minimal impacts relating to Major Accidents and/or emergencies.

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